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ABSTRACT

The Senate's Environmental and Public Works Committee conducted a hearing in October 2002 to assess green school initiatives: environmental standards for schools, school siting in relation to toxic waste sites, and "green" building codes. The committee reviewed activities undertaken by the Environmental Protection Agency's (EPA's) Office of Children's Environmental Health and the Office of Indoor Air Quality, as well as those taken by the Department of Energy concerning environmental and energy issues relevant to school properties. This document contains statements from that hearing. Statements were submitted by: (1) Sen. James Jeffords; (2) Sen. Hillary Rodham Clinton; (3) Ramona Trovato, EPA; (4) Claire Barnett, Healthy Schools Network; (5) Alex Wilson, U.S. Green Buildings Council; (6) Lois Gibbs, Center for Health, Environment and Justice; (7) Veronika Carella; (8) Geri Unger, Funders' Forum on Environment and Education; (9) Daniel Schwartz, Children's Environmental Health Network; (10) Christine Gustafson; (11) Philip J. Landrigan, Mount Sinai School of Medicine; (12) Rochelle Davis, Illinois Healthy Schools Campaign; (13) Tolle Graham, Massachusetts Healthy Schools Campaign; (14) Suzanne Miller, Vermont Public Interest Research Group; (15) Derek Shendell, University of California Los Angeles School of Public Health; (16) Jenna Orkin, 9/11 Environmental Action; (17) Joellen Lawson; and (18) Katie Acton. (EV)

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ED 474 531

Green School Initiatives

Statements from Hearing of the U. S. Senate
Environment and Public Works Committee
107th Congress, Second Session.

October 1, 2002

Full text available at:
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October 1, 2002. Full committee hearing.

The Environment and Public Works Committee conducted a hearing to assess green school initiatives: environmental standards for schools, school siting in relation to toxic waste sites, and "green" building codes. The committee reviewed activities undertaken by the EPA's Office of Children's Environmental Health and the Office of Indoor Air Quality, as well as those of taken by the Department of Energy, concerning address environmental and energy issues relevant to school properties.

Tuesday, October 1, 2002
9:30 a.m.
Hearing Room (SD-406)

Opening Statements:

Sen. James M. Jeffords, of Vermont.
Sen. Hillary Rodham Clinton, of New York.

Witnesses:

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Office of Environmental Information
U.S. Environmental Protection Agency
Washington, DC

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Executive Director
Healthy Schools Network
Albany, NY

Alex Wilson
President
BuildingGreen, Inc.
Brattleboro, VT
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Lois Gibbs
Executive Director
Center for Health, Environment and Justice
Falls Church, VA

Statements submitted for the record:

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Statement of Chairman James M. Jeffords
Senate Environment & Public Works Committee
Hearing on Green Schools: Environmental Standards for Schools

Good morning. I would like to begin by thanking our witnesses–both for being here today, and for your dedication to promoting green schools.

I also understand that we have parents of school children in our audience who have a personal interest in today's hearing. I appreciate, and am sorry for, the unfortunate experiences that bring you here today. The statistics are truly alarming.

- More than 14 million children attend schools with an environmental problem.
- More than $320 billion will be needed to bring schools up to healthy standards nationwide. If the Federal government fully funded its share of special education programs, the localities would have the ability to provide more funding for green schools.
- More than 1,100 public schools are built within a half-mile of a toxic waste site. The statement of Lois Gibbs, who is with the Center for Health, Environment and Justice, will discuss, in our second panel, the undeserved struggles of parents in these communities.

I am very disturbed by this information.

With all the concerns plaguing today's parents, the health of a child's school should not be an issue. Parents should be assured that the building and location in which their child spends the majority of his or her time is safe and healthy. It is distressing that any child should be confronted with possible developmental impairment as a result of the school he or she attends.

I am pleased that EPA is here with us today. It seems that EPA is doing more than any other federal agency in the area of healthy schools.

I look forward to hearing more about EPA's initiatives, such as the "Tools for Schools" program. I am, however, sorry that the Departments of Education and Energy could not be with us today. I hope to work with the Department of Education in the coming months. I also hope the Department of Energy becomes more engaged in green school initiatives.

I recognize and appreciate the local nature of issues related to schools. In my own home state of Vermont, a Healthy Schools bill was signed into law in the spring of 2000. This is a positive step forward to address the indoor air quality in Vermont's schools, and to limit exposure of Vermont's teachers and children to potentially harmful environments. However, there is much that can be done at the federal level.

First, we need good scientific data to better understand the link between outdoor and indoor environments and student health and learning. Second, in the context of school siting, construction, and renovation, we need federal guidelines that take a child's small size and developmental needs into consideration.

Finally, we need to invest long-overdue resources and coordinate federal, state and local efforts to improve the health of our schools.

Studies indicate that the benefits of green schools are numerous.

- Green schools can save 40 percent or more on energy costs, as Alex Wilson discusses in

his testimony. Mr. Wilson, from Vermont's BuildingGreen, Inc., is on our second panel today.

- Students in schools that rely primarily on daylighting perform up to 26 percent better on standardized tests than their counterparts in poorly lit schools.
- Claire Barnett, with the Healthy Schools Network, will point out in her statement today that an estimated 17 million school days were lost in 1997 due to asthma. Taking steps to address air pollutants leading to asthma would mean higher school attendance.

These are the kind of statistics I prefer.

I am hopeful that today's hearing sheds some light on how to achieve greener schools, and thus better health, for our students and teachers.

I have highlighted points that will be made by each witness in our second panel. A lot of thought and consideration have gone into these testimonies. I urge EPA, as well as the Departments of Education and Energy, to carefully review our witnesses' statements.

There is no greater investment than the one we make in our children, and their centers of learning and socialization. I look forward to working with all of you to promote green schools.

Opening Statement of Senator Clinton
EPW Hearing on Green Schools: Environmental Standards for Schools.
October 2, 2002

I want to thank Senator Jeffords for calling this important hearing.

And I would like to take this opportunity to welcome today's witnesses – including Claire Barnett from the Healthy Schools Network in Albany, New York, and Lois Gibbs, who got her roots – and perhaps established the roots of the entire Superfund program – when she was living in Love Canal, near Niagara Falls in upstate New York.

I am sure we all agree on the importance of keeping the school environment safe for our nation's children.

Children are in school about six hours a day, five days a week, one hundred and eighty days a year.

Yet increasingly it appears that our nation's schools may actually be making our children sick, instead of teaching them how to read and write.

Twelve million children under the age of eighteen now suffer from a developmental, learning or behavioral disability. Since 1977, enrollment in special education programs for children with learning disabilities has doubled.

State and federal education departments spend about $36 billion a year on special education programs for individuals with developmental disabilities.

In New York alone, there are two hundred and six thousand learning disabled children – this is fifty percent of the special education population in New York.

Now, I am certainly not suggesting that it is the environment in our schools that is solely to blame.

But research suggests that genetic factors explain only ten to twenty percent of developmental diseases.

In fact, a National Academy of Sciences study suggests that at least twenty-eight percent of developmental disabilities are due to environmental causes. And remember – a large part of that environment for children is the school environment.

Pediatricians and researchers do not know the causes for most developmental, learning and behavioral disabilities. But considerable research has shown that pollutants such as lead, mercury, pesticides, and dioxin contribute to these problems.

Proving the exact role of environmental factors in these problems will take time and research, but it would be easier to gather the necessary data on disease incidence and potential environmental causes if we had a Nationwide Health Tracking System such as the one that Senator Harry Reid and I have called for in legislation introduced earlier this year.

We cannot sit back and allow our children to be hurt by the schools that are supposed to help them to become the leaders of tomorrow.

While we have taken some important steps towards making our schools healthier and safer, there is still much work to be done.

That is why I fought to get important provisions included in the No Child Left Behind Act – inclu
I have made multiple requests to obtain a status report on this study, and I have received assuranc

I also sponsored an amendment to the No Child Left Behind Act that would provide schools with resources and technical assistance for renovation. This program, Healthy and High Performance Schools, will help schools get rid of mold, lead, and other contaminants that contribute to unhealthy environments for students. This provision was based on the Healthy and High Performance Schools Act that I introduced last year.

Unfortunately, this provision of the law remains unfunded, and I am extremely concerned that states will not be able to renovate their schools – schools which average over 40 years in age and over half of which that have at least one unsatisfactory environmental condition. Neither will they be able to make improvements that could save 25-30 percent of the approximately $6 billion that schools spend annually on energy costs. [Show brochure that you released last year.]

We also need to make certain that the six thousand new schools that are needed over the next ten years are built on solid environmental ground – literally.

In a recent report by the Center for Health, Environment and Justice – which I know we will hear more about later this morning -- over 1,100 public schools in five states (New York, California, Michigan, Massachusetts and New Jersey) were found to be located within a half-mile of a Superfund site or a site that appeared on a state hazardous waste site list – over 600,000 children attend classes in those schools.

In New York alone, the report identifies 235 schools in 39 counties that are within a half-mile of a contaminated site.

In May, I sent a letter to Administrator Whitman, urging the EPA to establish environmental guidelines for the siting of public schools.

I believe that establishing uniform guidelines would provide local communities with the tools they need to locate schools in places that will allow our children to learn, grow, and develop in a safe and healthy environment – and I look forward to hearing more on this from EPA today.

Unfortunately, the recent tragedy of September 11th, 2001, has presented yet another set of challe
We can and should learn from the experiences of the children of the schools of Ground Zero: P.S.

I want to point out a book "Schools of Ground Zero: Early Lessons Learned in Children's Enviro

As I have said, there is so much work left to be done. So I am glad that we are here today to learr

TESTIMONY OF
E. RAMONA TROVATO
DEPUTY ASSISTANT ADMINISTRATOR
OFFICE OF ENVIRONMENTAL INFORMATION
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

October 1, 2002

Mr. Chairman and Members of the Committee, I am Ramona Trovato, Deputy Assistant Administrator for EPA's Office of Environmental Information (OEI) and former Director of EPA's Office of Children's Health Protection (OCHP). I am pleased to be here on behalf of Administrator Whitman to discuss EPA's efforts to ensure that our schools are safe and healthy places for our children to learn. Administrator Whitman is a strong advocate for children and has been committed to improving and promoting EPA's programs to address environmental hazards in schools from the day she arrived. I am particularly happy to be here today because today marks the first day of Children's Health Month.

Protecting our children's health is a priority of this Administration and of EPA. Children are our most precious assets, and they can be more vulnerable to many environmental contaminants than adults. Children's bodies are still developing, and they may be exposed to more environmental contaminants than adults both because they eat, drink, and breathe more per pound of body weight, and because their behaviors – like putting things in their mouths and playing on and close to the floor– may bring them in greater contact with contaminants than typical adult behaviors. Throughout the month of October, a collaborative effort of 17 Federal departments, agencies, and White House Offices will celebrate Children's Health Month by making a special effort to raise awareness of the importance of protecting our children from environmental health and safety risks and by publicizing tips throughout the month for parents and other care providers to follow to keep our children healthy and safe. I encourage you to visit a special inter-agency web site (www.childrenshealth.gov) and help to publicize the practical steps that people can take during this month – and throughout the year – to protect kids.

Every time I hear the statistics _ 15 million people in America suffer from asthma, one_third of whom are children under the age of 18 _ I am reminded of what a gift it is to breathe freely. Asthma is the leading chronic illness in children and the cause of 14 million missed school days each year. Allergens, including those from mold, cockroaches, dust mites, and animal dander, are all commonly found in indoor environments, including schools, and are known to trigger asthma attacks. Outdoor air pollution from pollutants such as particulate matter and ozone also induce asthma episodes.

Hundreds of thousands of children living in the United States still have blood lead levels high enough to impair their ability to think, concentrate, and learn. Lead poisoning also lowers IQ and increases behavioral problems. Although lead paint hazards in older homes are the biggest concern because of exposures to very young children, lead paint is still found in many older schools, and lead can be found in the drinking water of both old and new schools.

Children in our nation's schools may also be exposed to many other contaminants, including chemicals in cleaning products and art supplies, materials and furnishings used in school buildings, fumes from idling school buses, pesticides, radon and potentially even to mishandled sources of mercury and asbestos. And the list goes on.

Unfortunately, in far too many cases, because of severe past budget shortfalls, our schools are old and inadequately maintained, leading to a host of environmental problems that can have dramatic impacts on children, staff, learning and the fiscal bottom line. Both the General Accounting Office and the National Center for Education Statistics of the Department of Education have documented the poor physical condition of many of our older school facilities.

More than 53 million elementary and secondary students attend approximately 112,000 public and private schools in the United States. Along with approximately 3 million teachers and staff, this represents about 20% of the U.S. population. The average child spends about 1,300 hours in a school building each year; teachers and other employees spend even longer periods.

According to the National Center for Education Statistics report, The Condition of America's Public School Facilities: 2000, about one-quarter of schools report that they need extensive repair or replacement of one or more buildings. Approximately 11 million students attend these schools. About 40% of schools report at least one "unsatisfactory environmental condition" such as poor ventilation, heating or lighting problems, or poor physical security. According to a 1996 study by the General Accounting Office, America's Schools Report Differing Conditions, these unsatisfactory environmental conditions are most often reported in urban schools, schools with high minority student enrollment, and

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schools with a high percentage of low income students. In some instances, low income and racial/ethnic minorities have increased exposure to environmental hazards and suffer disproportionately from environmental exposures. For example, the Department of Health and Human Services has estimated that African American children are three times more likely than white children to be hospitalized for asthma and asthma-related conditions; these children are four to six times more likely to die from asthma. These disparities are often at least partially attributable to differences in health care. Minority children also have significantly higher rates of elevated blood lead levels.

To date, school facility conditions have not been widely perceived as playing a critical role in the education process, largely due to the fact that research into the complex relationship between aspects of the physical environment, including environmental factors, and the well-being, health, productivity, and academic performance of students is only now emerging. In fact, the Lawrence Berkeley National Laboratory has recently conducted a review of the scientific literature in this area at EPA's request, and EPA is preparing a summary of the existing science that may associate indoor air quality factors in schools and other buildings with health, productivity, and performance of children. EPA is also supporting research in this area. Our Science to Achieve Results (STAR) extramural research grant program already supports a limited amount of research on school environments. In 1997, the program provided funding to the University of Minnesota for a school-based study of complex environmental exposures in children at the University of Minnesota. This study used outdoor, in-home, in-school, personal, and human tissue monitoring to quantify exposures among children in two low-income, racially diverse schools in Minneapolis. The Agency continues to explore research related to children's health and the school environment.

Despite the emerging nature of research into the relationship between environmental factors and learning, if a child suffers an asthma attack in class or is not in school because of asthma; if the school is closed because of an environmental health or safety episode; or if the ventilation system is providing little or no fresh air, that child may not be learning up to his or her full potential.

Many schools are being temporarily evacuated or permanently closed due to environmental problems, making the difficult task of educators even more challenging. Moisture problems in schools are known to contribute to both mold and pest problems that may directly affect allergic or sensitive individuals and which can lead to increased application of pesticides. In one case, an elementary school in Fairfield, Connecticut was permanently closed after efforts to fix persistent mold and moisture problems over a period of several years were unsuccessful. The school closure will cost the local school district an estimated $21 million to replace the school in addition to the costs to demolish the existing structure. The chief of allergy and immunology at the nearby medical center who treated many of the students and teachers over the years estimated that the building impacted the health of up to 40% of students and staff.

Funding for school construction, renovation and repair, raised largely through state and local bond issues, has increased significantly over the past several years, suggesting that the general trend for school improvements is favorable. Nevertheless many schools continue to provide less-than-ideal conditions to facilitate learning, and many may pose unnecessary risks to the health of children, staff and visitors.

The public becomes aware of new environmental challenges for schools on a regular basis. Siting of schools on or near contaminated sites, exposures of children to outdoor sources such as diesel bus exhaust, the increasing reliance on portable – or relocatable– classrooms, and the rapidly growing issue of mold contamination all suggest the need for the Federal Government to provide appropriate guidance and technical assistance to states and communities to address environmental health issues in schools. One excellent resource is the National Clearinghouse for Educational Facilities, funded by the U.S. Department of Education.

Within EPA, we have been working very hard for the past several years to help schools address environmental issues. While there is no known cure for asthma, asthma attacks can be prevented by reducing exposure to environmental triggers and by ensuring that all children receive appropriate medical care. EPA is a committed Federal partner in the battle against asthma. Because we believe that one asthma attack is too many, EPA is working to reduce asthma triggers in both outdoor and indoor air.

In February, the President announced the Clear Skies Initiative, which will dramatically cut air pollution by nitrogen oxides, sulfur dioxide, and mercury by 70 percent, using a mandatory, market_based approach. Clear Skies will help to prevent asthma attacks in children. Clear Skies will also help to prevent thousands of premature deaths in the U.S. population.

But Clear Skies is just one part of our effort to make America's air cleaner. We need to make sure that the buses that take our children to school aren't causing them to miss school. President Bush recently approved an EPA rule to reduce pollution from diesel buses and trucks and to require cleaner diesel fuel that will reduce the harmful pollutants from diesel engines by more than 90 percent over today's engines.

EPA has also been leading the charge to help schools address indoor air quality (IAQ) problems through its widely acclaimed *Indoor Air Quality Tools for Schools* program. *IAQ Tools for Schools* provides an effective framework as well as practical tools to help schools prevent and solve all kinds of environmental problems affecting indoor air quality in schools. More than 10,000 schools are using the program, and major school districts around the country – including New York City Schools, Dallas, Brevard County, Philadelphia and LA Unified School District – are committed to using the IAQ Tools for Schools as part of their health and safety programs.

We have dozens of anecdotal examples of schools and school districts for which the *IAQ Tools for Schools* program has provided demonstrable benefits, including reducing asthma related nurse visits and missed school days. We recognize, however, that we need better tools to document and measure the effectiveness of the *IAQ Tools for Schools* program. One initial effort is a survey we conducted this past summer that will help us better quantify the reductions in IAQ-related complaints, in absenteeism, and in costs which many schools are reporting as they implement the program.

EPA continues to develop new IAQ tools for schools. The Agency has released specific guidance to help schools identify and fix mold and moisture problems and is working closely with other Federal agencies – particularly CDC– to help ensure that schools, the public and others receive the most accurate and scientifically sound information on mold related health effects and remediation techniques.

By the end of the year, EPA will also release new web-based guidance devoted to school design, construction and renovation issues titled *Indoor Air Quality Design Tools for Schools*. This guidance for new and renovated schools will complement EPA's *IAQ Tools for Schools* program, which aims to help *existing* schools prevent and solve indoor air quality problems. The new *IAQ Design Tools for Schools* guidance will encourage schools to make indoor air quality goals part of the school planning and design process. It also discusses factors to consider in the siting of school facilities, stresses the importance of building commissioning, and provides guidance on a host of other issues related to the indoor environment. The guidance will draw from EPA expertise as well as from some excellent resources that have emerged from State and private sector initiatives such as the California Collaborative for High Performance Schools and the US Green Building Council's LEED (Leadership in Energy and Environmental Design) Green Building Rating System, among many others. The draft *IAQ Design Tools for Schools* guidance was widely available this summer for public review, and we are now integrating comments from a broad spectrum of interests.

I know that this Committee is particularly interested in the issue of school siting. However, as you know, selection of sites on which to build new schools is largely a local decision and a local issue. Many factors related to the availability and cost of land, community values, and a host of other factors come into play. Unfortunately, in a number of cases and for a variety of reasons, schools are sometimes being built on or close to existing sources of air, water, and/or soil contamination. While the Federal Government does not play a direct role in these decisions, we can help communities make wise decisions by providing better information of potential environmental risks and ways to reduce those risks. For example, the draft *IAQ Design Tools for Schools* guidance recommends early involvement in the siting process by the community, a thorough Phase I environmental site assessment using ASTM guidelines before the site is acquired, and a more detailed site assessment and, if needed, clean-up plan, before deciding to build. There are also a number of tools available to assist communities, including EPA's Enviro Facts Data Warehouse (http://www.epa.gov/enviro/), which provides a wealth of resources to help the public access environmental information about their community.

The *IAQ Design Tools for Schools* guidance also strongly encourages school districts to embrace the concept of designing and building High Performance Schools. High Performance Schools are simply schools in which a wide range of issues associated with site planning, energy use, indoor air quality, day-lighting, acoustics and other building systems are considered as a whole building *integrated* design that can save energy, natural resources and money. These concepts are being demonstrated as cost-effective in a number of State, local and private sector initiatives around the country. Energy efficient design can result in reduced construction costs as well as reduced operating costs. Even in cases where construction costs are higher, energy savings can pay for additional up-front costs very quickly, sometimes in less than a year. And this doesn't include the potential benefits of improved health, productivity and performance.

Another of EPA's priorities is protecting children from unnecessary exposure to pesticides that are used in and around schools to control pests. EPA is encouraging school officials to adopt Integrated Pest Management (IPM) practices to reduce children's exposure to pesticides. EPA is helping schools understand and implement IPM through the distribution of printed publications, awarding grants to start IPM programs, offering workshops and courses, and providing guidance and assistance through the Tools for Schools Program, as well as partnerships with Universities and national associations. EPA has funded two technical resource centers to promote IPM in schools and day care centers, by providing tools, training and technical support to start IPM programs. The Centers also provide support to State efforts and foster sharing of IPM resources nationwide.

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EPA has also recently published a brochure on Protecting Children in Schools from Pests and Pesticides. Over 100,000 copies have already been distributed to schools around the country. The brochure is also available on EPA's website at www.epa.gov/pesticides/ipm.

EPA has a wealth of other information and programs to assist schools. The *SunWise School Program* is an environmental and health education program that aims to teach children and their caregivers how to protect themselves from overexposure to the sun's harmful ultraviolet (UV) radiation. SunWise partner schools sponsor classroom, school, and community activities that raise children's awareness of stratospheric ozone depletion, UV radiation, and simple sun safety practices, that can ultimately lead to sustained sun-safe behaviors. *WasteWise* is a free, voluntary EPA program through which organizations eliminate costly municipal solid waste, benefiting their bottom line and the environment. EPA's *Water Alliances for Voluntary Efficiency* (WAVE) program is a voluntary partnership with institutions such as schools and commercial businesses to prevent pollution and to reduce the demand for and to promote the efficient use of water and energy resources. The *Buy Clean* pilot program is an EPA initiative to partner with schools and others to promote the purchase of products and services for a healthy indoor environment for schools. EPA's *EnergyStar* for Schools program is helping schools conserve energy through the use of benchmarking and other tools. Our EnergyStar partnership with the Department of Energy has been a tremendous success. EPA has also recently created a Green Buildings Web Portal to help the public find green building resources throughout EPA.

EPA is very aware of the resource and other constraints under which many schools and school districts labor, and we recognize the importance of providing not just more and better guidance, but better coordinated and integrated programs that will make the job of addressing environmental health issues easier for schools, or at the very least, more efficient. Our goal is to make our environmental programs directly support schools in achieving their primary mission of educating children.

To achieve this, EPA programs emphasize partnerships with those who have the direct responsibility for educating our children and all of the constituencies that are part of the educational process. This includes relationships with individual schools, school districts, and organizations representing school administrators, school nurses, teachers, facility planners and managers, architects, engineers, parents, and even kids. We partner with other Federal agencies, with states, tribes, and with communities to assist schools in any way we can.

We are also working within EPA to better coordinate and integrate existing programs. Toward that end I am pleased to be able to report to you today that just a week ago we inaugurated a new *Healthy School Environments Web Portal* to provide one-stop access to EPA resources for schools, as well as to help school administrators, facility managers, design engineers, architects, health professionals, parents, teachers, staff and students find helpful resources from other Federal agencies, States, communities and non-governmental organizations.

We are looking for additional opportunities to streamline EPA programs for schools and make them more accessible and more helpful. We recently received a number of recommendations regarding EPA's school programs from the EPA's Children's Health Protection Advisory Committee. These recommendations are consistent with our efforts to improve the guidance available to schools and better coordinate EPA programs.

We believe it is critically important for Federal agencies to work together and in close collaboration to coordinate and leverage existing Federal programs and resources impacting children's health in schools. The *President's Task Force on Environmental Health Risks and Safety Risks to Children,* co-chaired by Administrator Whitman and Secretary Thompson, has proven to be an effective forum to facilitate increased coordination and collaboration within the Federal community on a variety of issues, including asthma, lead, unintentional injuries, childhood cancer, and now schools. The Task Force has identified school environmental health as a priority and established an interagency Schools Workgroup to identify opportunities for better coordinating Federal efforts in this area. The Schools Workgroup is co-chaired by EPA, the Department of Education and the Department of Health and Human Services, and includes representatives from other Federal agencies involved in school health issues, such as the Department of Energy, the Department of Agriculture, and the Department of Labor, among others.

The President's Task Force Schools Workgroup is currently developing an inventory of federal programs related to school environmental health. The primary goal of the inventory is to inform the development of a strategic plan that will provide recommendations for increasing the effectiveness of Federal school environmental health programs. The inventory will also be incorporated into a publicly accessible electronic database of school environmental health programs and activities.

The creation of the workgroup has already substantially improved coordination and cooperation within the Federal community in addressing school environmental health issues. For example, EPA and CDC have offered their assistance and are providing information to the Department of Education to help them scope the study of Unhealthy School Buildings

mandated by the No Child Left Behind Act. EPA is also becoming an active participant in the National Coordinating Committee on School Health, which is sponsored by DHHS, the Department of Education and the Department of Agriculture and is comprised of many of the non-governmental organizations interested in school health issues.

In conclusion, EPA is committed to working within the Federal community, with states and tribes, local governments and communities, as well as with public and private non-governmental organizations to promote children's health in our nation's schools.

Thank you for the opportunity to testify today. I look forward to working with you to make our schools the healthiest possible environments in which to learn as well as to work.

I will be glad to respond to any questions you may have.

Statement of Claire Barnett, Executive Director,
Healthy Schools Network

Attachment to Testimony at : http://www.nyc.gov/html/ddc/html/highperf.html

Good morning. Thank you Senator Jeffords, Senator Smith, and other members of the U.S. Senate's Environment and Public Works Committee for holding this historic hearing on the greening of our children's workplaces. There are several questions I hope you will focus on today.

- What do we know about environmental hazards in schools?
- What do we know about how these affect child health and learning?
- What systems are in place to ensure that the opportunities to protect child health and learning and to protect the environment are accessible and implemented?
- What roles should US EPA play an improving school facilities and child health and learning?

The questions are not simple: effective federal responses to the multiple environment and environmental health questions facing all children and their schools requires integrating the expertise and efforts of several disciplines and agencies at the federal level and within the states.

My name is Claire L. Barnett. My husband and I moved from Westport-on-Lake-Champlain, NY to Saratoga Springs, NY where we now reside a few years ago. I am Executive Director of *Healthy Schools Network, Inc.*, a national environmental health research, information, and advocacy organization; a former PTO President from upstate New York; the parent of a health-impaired child once in special education; and today, the representative the parents of 50 million children and the 5 million school personnel-- such as those with me here today, Joellen Lawson (CT), Jenna Orkin, (NY), Veronica Carella (MD), Grayling White (TN), Judy Sazonski (CT), and Robin Starinieri (VA) whose lives have been impacted by the poor conditions of schools and the lack of any comprehensive system to protect children and adults from indoor environmental hazards at school.

The national *Coalition for Healthier Schools* is comprised of over 75 national, state, and local parent, public health, environment, and education groups and is dedicated to assuring that all children and personnel have schools that are environmentally healthy. Several representatives of organizations in the Coalition are here today whom I wish to recognize: American Public Health Association, Beyond Pesticides, Children's Environmental Health Network, National Education Association, and National Environmental Education and

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Training Foundation. The *Coalition* helped secure $1.2 billion in federal funds for school repairs in the fall of 2000 and successfully campaigned last year for the "Healthy and High Performance Schools" provisions now in the "No Child Left Behind Act of 2001".

Healthy Schools Network also helped organize countless local healthy schools groups and coalitions in several states. It is through this rapidly growing network of concerned groups that our *Healthy Schools/Healthy/Kids Clearinghouse* noticed the outbreak of school rashes last year and with national partners asked the federal Centers for Disease Control/National Center for Environmental Health to launch an investigation and to report to Congress (correspondence attached).

Applying our skills in New York State, Healthy Schools Network recently completed a two year grant that funded intensive outreach to 225 low-income schools on greening existing schools, including healthier cleaning and pest control, Indoor Air Quality (IAQ) protocols, and health & safety committees that are required under state regulations. After the World Trade Center attacks, we provided extensive help to the communities and Parent Associations of the seven public Ground Zero Schools. Our commissioned research report on their experience, *Schools of Ground Zero: Early Lessons Learned in Child Environmental Health,* is now a book co-published with the American Public Health Association that I will provide to the Committee for its records.

The lesson from all of our work and the book: "...N is for No System to Protect Children."

CHILDREN, SCHOOLS, AND ENVIRONMENT

Americans spend 85-90% of their time indoors. For the 55 million children and adults in 115,000 schools today, Tuesday, October 1, 2002, the first day of Child Health Month, they know that schools are more densely occupied and less well maintained than commercial offices. The US General Accounting Office reported in 1995 that over 14 million children were in schools that threatened their health. Environmental factors included indoor air pollution, lighting and plumbing deficiencies, and ventilation problems, problems that don't away on their own. US EPA states that indoor air pollution is one of the top five hazards to human health. The American Society of Civil Engineers reports that our schools are in worse condition than any other infrastructure including prisons (attached, American Society of Civil Engineer's 2001 Report Card for America's Infrastructure/Schools) showing that 65% of schools in the District have bad plumb, and 52% of schools in Alaska and 47% in New Hampshire have air pollution. While enrollments have grown, schools have decayed and renovations and new construction have not kept pace; meanwhile, schools everywhere are enrolling more and more children with special needs: asthma, attention deficit, autism, severe allergies, learning disabilities. Seventeen percent of children under 18 have been diagnosed with one or more developmental disabilities. These disabilities include Attention Deficit-Hyperactivity Disorder (ADHD) and autism and are the result of complex

interactions among genetic, environmental and societal factors that impact children during vulnerable periods of development. These children especially do not thrive in the polluted indoors.

As the federal executive order on child environmental health reauthorized by President Bush reaffirms, children are more vulnerable to environmental hazards that adults. Our challenge is how do we create greener buildings for children-- from existing building, and with renovations and all-new buildings?

What do we know about environmental hazards at school and the effects on child health and learning?

A is for asthma and air quality.

Children are especially susceptible to air pollutants. Children have increased oxygen needs compared to adults, they breathe more rapidly and, therefore, inhale more pollutants per pound of body weight than adults. They often spend more time engaged in vigorous outdoor activities than adults.

- Asthma is the leading cause of school absenteeism due to a chronic illness. The U.S. Environmental Protection Agency estimated that American children lost 17 million school days in 1997 due to the disease, and that parents lost 5 million work days in order to care for their children with asthma-related illness. Nearly 1 in 13 school-age children has asthma (CEHN).

- Major indoor triggers of asthma attacks include irritants such as paints, cleaning agents, pesticides, perfumes, sealants, plastics, adhesives, insulation materials, animal and insect allergens, environmental tobacco smoke, and molds (CEHN). All of these can be found in schools, including 'huffable' spray paints, markers, and fixatives.

B is for bugs and bioaerosols.

Schools that are poorly designed or constructed, or in poor condition, or that have inadequate maintenance, inadequate food storage or garbage and recycling areas, will be subject to pest infestations. Pests like what we like: food, water, and safe place to nest. It is better for the building, healthier for occupants, and cheaper to keep pests out of schools than to continuously apply toxic pesticides. According to Beyond Pesticides, to protect children from unsafe, unhealthy practices, more than thirty states have placed limits on school pesticide uses. Pest-proofing of a facility during renovations or repairs is cost effective step to promoting an environmentally healthy school.

- Information about on the amount of pesticides used in the nation's 110,000 public schools is not available. The Federal government does not collect such data, and, as of 1999, only two states collected data on pesticide use in a manner that allows for identifying use in

school facilities. From 1993 through 1996, about 2,300 pesticide-related exposures involving individuals at schools were reported, according to the American Association of Poison Control Centers (although these data are not believed to be complete) (CEHN).

Bioaerosols, specifically, molds in schools is new 'hot' issue but hardly a new issue historically. Molds are everywhere, indoors and out and grow by digesting what they sit on. There is no such thing as a mold-free environment. There are thousands of different kinds of molds; different individuals may react differently, and some not at all. Testing for molds is unreliable, and since most are capable of causing illness and eat way at building elements, testing is more beneficial to the vendors than to schools. The message is prevention is cheaper than remediation: reduce humidity, stop leaks, respond promptly to spills and flooding, and take health complaints seriously the first time.

C is for children and chemicals.

Chemical toxicants and biological agents in the classroom, on the playground, in the science lab, or in other school facilities can lead to health risks and adverse learning conditions. They can affect many different body systems and impact health, learning, productivity, and self esteem.

One very effective way to improve indoor environments is to use less-hazardous, or environmentally preferable purchasing (EPP) to buy products for cleaning and repair work. EPP applied to custodial product purchasing can result in a zero-cost, environmental change. The basic steps to healthier cleaning include keeping dirt and grime out of the building, then by consulting the product labels and Material Safety Data Sheets, determining which products have the least hazardous properties (HSN).

Other than lead, asbestos and radon, the Federal government has not instituted requirements or guidelines that would protect children from the same chemical exposures that require employee notification and other worker protections.

Schools are places where children and elemental mercury may come together via thermometers and barometers, in laboratory courses or "show-and-tell." Mercury can also be released through broken fluorescent light tubes or thermostats.

- Mercury is a potent neurotoxicant and children are particularly susceptible to mercury's dangers. Mercury interferes with brain development and more easily passes into the brains of fetuses and young children than into the brains of adults (CEHN).

- Mercury-containing products or spills must be properly handled. Even small mercury spills require specialists. Improper clean-up of a mercury release, such as vacuuming up the mercury from a broken thermometer, will spread the mercury into the air (CEHN).

Other sources of chemicals in schools will include science laboratories, vocational education classrooms, art rooms, copy shops, computer rooms, and custodial storage areas. There is no system that attempts to assess the types of chemicals used in schools, including pesticides. Federal Executive Order 13101 on Environmentally Preferable Purchasing has not been systematically extended to schools to assist them with setting purchasing specifications that will drive out toxic products that may contribute to employee injury, storage problems, disposal problems, air pollution, and student illness or health risks. The Agency for Toxic Substances and Disease Registry (ATSDR) studied evacuations from educational facilities, often caused by chemical spills or releases, and found-- not surprisingly that the evacuees and victims from schools are younger and more numerous than those from other institutional settings. The most common substances involved were mercury, then tearing agents, hydrochloric acid, chlorine, ethlene glycol, and formaldehyde. There was no estimate of the cost to health, learning, or school administration.

Lead comes with old infrastructure and will be found in paint dust and chips, window sills, the grounds next to an old building, grounds near highways and bridges, and in water. Lead is a potent neurotoxin. Exposure to lead can cause a variety of health effects, including delays in normal physical and mental development in children, deficits in attention span, hearing, and learning disabilities of children, as well as problems with impulsivity and aggression. Long-term effects can include stroke, kidney disease, and cancer. (AECLP, CEHN) Los Angeles Unified SD flags old classrooms for high priority clean-ups that have flaking paint or paint chips on the floors. New York State requires that areas to be disturbed during renovation be tested for lead.

- According to a report on the condition of the nation's school facilities by the U. S. General Accounting Office, schools built before 1980 were painted with lead paint.

- Children may also be exposed to lead through drinking water that has elevated concentrations from lead plumbing materials. Lead contamination in drinking water occurs from corrosion of lead pipes, lead soldered plumbing and storage tanks and lead-containing plumbing fixtures, and it cannot be directly detected or removed by the water system (AECLP, CEHN).

- Some support was provided to schools through the Lead Contamination Control Act of 1988 to identify and correct lead-in-drinking-water problems at schools, especially water coolers with lead-lined tanks (CEHN).

- Rifle ranges at school are another potential source of lead contamination (HSN).

N is for no system to protect children.

Twenty-six states have adopted federal Occupational Safety and Health (OSHA) standards for public employees, and thus these standards may well protect school employees. Although students may indirectly benefit from the OSHA and National Institute for Occupational Safety and Health (NIOSH) activities that cover school employees, OSHA and NIOSH have no jurisdiction for investigating the health impact of exposure to students. Parents of the Schools of Ground Zero learned this the hard way, as did the parents here with me today. Employees may call in NIOSH to evaluate workplace conditions. None has ever evaluated students who outnumber adults in school by an average of 10 or more to one. Two studies on employees of school in Lower Manhattan found health effects from indoor pollutants six months after the World Trade Center attacks. No similar studies are underway on the 3,000 students who returned to their 'workplace' in early October.

"N Is for No System to Protect Children."

Not one of the workplace standards have been set to protect children who are compelled to be in school, and none can be invoked by children or their parents. Parents cannot take their children to an occupational health clinic; they have no bargaining rights; they are not in school every day; schools may not reveal hazards and they have no system that provides a right to know; PTA's and PTO's are voluntary groups have no institutional history or capacity to conduct on site environmental health or workplace inspections.
HSN

Numerous studies conclude that there is an explicit relationship between the physical characteristics of school buildings and educational outcomes. To this end, research shows us that better quality buildings produce better student results on standardized tests (Rebuild American's Schools). For example:

- Four recent studies found higher test scores for students learning in better buildings and lower scores for students learning in substandard buildings. One of the more recent of these studies showed a difference in student test scores ranging from 5 to 17 percentile points (RAS).
- Another study in DC Public Schools showed that students in school buildings in poor condition scored 11% below students in buildings that were in excellent condition on standardized achievement tests (RAS).

Fresh Air & Sunshine: Healthy and High Performance Schools

Greener buildings are a return to 'the basics' of fresh air and sunshine in schools: fund and implement the Healthy and High Performance Schools to help address the environmental needs of decayed schools. It is set up to help schools with design, engineering, and materials selection during major renovations, financed by state agencies.

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The opportunity to merge national environmental and building sciences information and technical assistance with state energy, education, and environment programs, is unique, timely, and necessary. Volunteer local school boards simply are not equipped to do this alone.

The US Department of Energy's studies on schools and findings that schools could save 25% or $1.5 billion in energy with modest improvements. Other organizations have found school saving up to 50% on energy with new equipment and human behavior changes. Daylighting will yield higher test scores and save energy (HSN). We also refer you to the excellent green design guidelines for public buildings and schools by the New York City Department of Design and Construction that also offers in-depth assistance on materials selections.

While there is federal legislation and regulatory authority at US EPA on outdoor air, there are virtually no laws or enforceable regulations on indoor air quality (IAQ). Yet air pollution is air pollution indoors or out. Priority research needs for the field of **adult** workers was just published (Am J Public Health) that outlined an extensive NIOSH/National Occupational Research Agenda committee process. The process did not consider a child research agenda and it unclear if the longitudinal National Children's Study will undertake parallel research in this area. In fact no state has a system to collect or report student illness or injury, so improving on research means starting from square one. There was no baseline data on children's illnesses during the recent school rash outbreak.

The New London, TX School Disaster.

On March 18, 1937 a gas explosion killed nearly 300 students, teachers, and visitors. The investigation revelaed a litany of false savings, negligence in the design, installation, and maintenance of the heating system, weakness in ventilation, and refusal to listen to the complaints of school occupants. Only one of the many recommendations were ever put in place-- the addition of an odorant to natural gas.

Healthy Kids: The Key to Basics

Worse, for the parents of affected children and for school personnel, no school can prove it has acceptable indoor air by producing a test result. Indeed some research suggests that human sensors (the building occupants) are more sensitive than testing equipment and provide continuous on-site feed-back. We recommend to you the Indoor Air 2002 conference proceedings and bibliography that we will submit separately to Committee staff. Indoor air measures can be expensive and must be done under actual operating conditions, with the school fully loaded. Contaminants present can include asbestos, lead, mold spores, pet danders, volatile organic compounds, fumes from uncontrolled renovation projects and

cleaning products, instructional supplies, pest/pesticide and their residues, foods, garbage, or the not-so-subtle scents of middle-schoolers in an overheated building. There are some standards for individual contaminants of indoor air set for adult occupational exposures; California has set comprehensive standards for VOC's.

US EPA/Indoor Environments Division (IED) is to be commended for having a strong, voluntary program for schools, the "IAQ Tools for Schools" program. In addition to setting quotas for the regional offices and giving mini-grant to schools to spur implementation, EPA also developed educational materials, such as "Student Performance and School Air Quality" that indicates even healthy adults placed in a polluted indoor environment can have a 3-7% decline in speed and accuracy in keyboarding. There are no such studies on children, although I am sure every Committee Member would unanimously agree that every school principal wants a 3-7% gain in standardized test scores.

TfS implementation remains elusive, as it does with many voluntary school programs. At the Indoor Air conference in Monterey, US EPA/Region 2 staff presented its work in New Jersey: it has been able to initiate the voluntary program in only one percent of the schools in the state. **TfS** is sadly underutilized, and with a few exceptions, has not been well integrated into ongoing school facility work or state aid systems.

Implementation of Healthy and High Performance Schools provisions that give states funding and information for school renovations would greatly assist IAQ problems. Since implementation is scant and children are required to be in schools and schools have known air pollution problems, the real question is why is **TfS** is only a voluntary program. The difficulty in defining what **TfS** implementation consists of is part of the problem; another is the basic difficulty in extracting timely and accurate information from schools about environmental conditions and child health; and finally, the need for substantial increases in research into indoor air is also required.

Drugging Canaries

Asthma medications may have side effects, such as tremors, nausea, headache anxiety. Yet, some children now need on-site nebulizers just to attend polluted schools. On physician orders, some parents have kept children home. Some schools have quickly addressed the situation by providing home instruction, tutoring, building improvements, or alternative placements, while other parents are home schooling. We have also had calls from parents who tell us they have seriously ill children, have schools ignoring physician letters, and also report their schools have threatened to report them for child neglect based on long absences.

HSN

Needless to say, as Committee members and staff are aware, schools receiving any federal aid are required under Section 504 of the Rehabilitation Act of 1973 to provide accessible facilities. Under the Individuals with Disabilities Education Act (IDEA), schools

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must provide a free, appropriate public education to all children in the least restrictive setting.

The Outbreak of School Rashes.

Centers for Disease Control (CDC) launched a federal study of the outbreak of rashes that affected over 1,000 children in 27 states. Findings include the usual childhood diseases, eczema, applied chemicals and renovation dusts, and rashes of unknown origins. Despite premature media reports that attempted to paint this as 'female hysteria', the rashes appeared on both boys and girls, in different schools and in different classrooms, and in different states on the same day. At least one school in the state of Washington refused to allow the state to conduct an environmental investigation on site. In surveying members of the NYS Association of School Nurses two years ago, HSN learned that nurses are not allowed to tell parents about school conditions and that 71% of 206 respondents knew children who were affected (HSN).

This is not a system set up to protect children and to determine what the exposures and results of those exposures are. We encourage Congress to hear from CDC/NCEH and other agencies on how school environmental investigations should be carried out.

RECOMMENDATIONS

The root problem is that there is no system to protect children, and no system to deliver or enforce a consistent message with local schools. We believe that it is beyond the jurisdiction of this Committee acting alone to establish such a system, but we would urge future this Committee and others to explore these issues and possible solutions in depth with the array of federal agencies.

1. Fund and implement the Healthy and High Performance Schools provisions of the Leave No Child Behind Act, expanding the USD Education's ability to:

- **participate in the National Children's Study;**
- **participate in the Interagency Task Force on Risks to Child Health;**
- **conduct joint research with other federal agencies on how environmental hazards at school affect health and learning;**
- **provide incentives and information to the states to leverage their own 'high performance schools' programs.**

2. Institutionalize the National Clearinghouse for Educational Facilities and cross-link it to the other federal agencies' school environmental programs;

3. Expand US Environmental Protection Agency's schools programs, establishing it as an agency priority, including:

- research on indoor air at school and impacts on child health and learning;
- evaluating IAQ Tools for Schools and other school programs for their effectiveness at reducing children's toxic exposures and reducing absenteeism, or providing disability access to buildings;
- strengthening the EPA regional office's work with state agencies and advocacy organizations so that IAQ Tools for Schools and other programs are integrated into state agency efforts;
- expand US EPA's grants to the Pediatric Environmental Health Specialty Units, jointly funded with the Agency for Toxic Substances and Disease Registry;
- require US EPA and other federal agencies, in cooperation with environmental health and education groups, to develop best practice policies for school district maintenance and repair, consistent with 'greening' the existing infrastructure for the protection of child health. This should include methods and examples for applying the federal executive order on Environmentally Preferable Purchasing to school supplies and maintenance products.

5. Pass the federal School Environmental Protection Act (SEPA, HR 111 and HR 3275/S 1716 in the 106th Congress) that will have the effect of making schools 'pest-proof' their buildings and thus reduce their reliance on the routine use of highly toxic chemicals.

6. Fund school repairs and construction, directing a federal grant program at high needs schools and offer tax credits to subsidize the interest on school construction bonds used for repairs, renovations, and new construction.

ORGANIZATIONAL SOURCES AND ABREVIATIONS IN THE TEXT:

AECLP, Alliance to End Childhood Lead Poisoning
CEHN, Children's Environmental Health Network
HSN, Healthy Schools Network
RAS, Rebuild America's Schools Coalition

TESTIMONY BEFORE THE SENATE
ENVIRONMENT AND PUBLIC WORKS COMMITTEE

Hearing on High-Performance Schools, October 1, 2002

Presented by: Alex Wilson, President, BuildingGreen, Inc.

Mr. Chairman and members of the Committee, my name is Alex Wilson. I am very honored and pleased to have this opportunity to address the issue of high-performance or "green" schools before this Committee.

I am president of BuildingGreen, Inc., a small company in Brattleboro that is recognized as one of the leading national providers of information on environmentally responsible design and construction. My company publishes *Environmental Building News*, which is read by over 10,000 architects and other building professionals nationally and internationally.

I also serve on the boards of the U.S. Green Building Council and the Sustainable Buildings Industry Council, both here in Washington and both involved in efforts to advance the implementation of energy-efficient, environmentally responsible buildings. I am pleased to report that the membership of the U.S. Green Building Council, which has been growing by 100% per year for the past five years, has just surpassed 2,000 companies, and the Leadership in Energy and Environmental Design (LEED) building rating program the organization runs is quickly becoming the most important driver of green design in the country.

The Sustainable Buildings Industry Council (SBIC) has been particularly active in advancing high-performance schools nationwide. Senator Bonds may be interested to learn that SBIC is today leading a workshop on high-performance buildings in St. Louis.

My hope here is to provide a quick overview of what a high-performance school is, address the benefits of these schools, describe a few examples, and provide recommendations as to how the Federal Government can support the implementation of high-performance school design, construction, and operation.

What is a High-Performance School?

The Collaborative for High Performance Schools in California defines high-performance schools as "facilities that improve the learning environment while saving energy resources and money."[1] The Sustainable Buildings Industry Council (SBIC) describes a high-performance school as having three key characteristics[2]:

1. It is **healthy and productive** for students and teachers, in that it provides:
    - High levels of acoustic, thermal, and visual comfort;
    - Significant amounts of natural daylighting;
    - Superior indoor air quality; and
    - A safe and secure environment.
2. It is **cost-effective** to operate and maintain, because its design employs:
    - Energy analysis tools that optimize energy performance;
    - A life-cycle cost approach that reduces the total costs of ownership; and

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- A commissioning process to ensure that the facility will operate in a manner consistent with design intent.

3. It is **sustainable**, because it integrates:

- Energy conservation and renewable energy strategies;
- High-performance mechanical and lighting systems;
- Environmentally responsive site planning;
- Environmentally preferable materials and products; and
- Water-efficient design.

Organizations seeking to advance high-performance schools all emphasize an ***integrated, whole-building*** approach to the design process. This means that the different elements—building envelope, lighting, mechanical systems, etc.—must be considered holistically, from the beginning of the design process through construction and operation of the building.

This is quite different from the design process used in creating most non-residential buildings. The conventional design process is like a relay race, in which the architect designs the basic building and passes the baton to the mechanical engineer. The mechanical engineer designs the mechanical systems needed to maintain comfort, then passes the baton on to the lighting designer, and so on. With integrated design, all members of the design team meet periodically throughout the planning and design process. Synergies are identified—for example, recognition that if better glazings and energy-efficient lighting systems are installed, the air conditioning system (chiller) can be downsized. Identifying these opportunities becomes possible only through a collaborative, or integrated design process.

The other key aspect of a high-performance school is that it is the product of well-thought-out **goal-setting** on the part of the school district and the design team.

I am currently the environmental consultant on a complex school project in Brattleboro, Vermont. This is the largest school construction project ever undertaken in Vermont, involving three schools serving 1,600 students. With a $57 million budget, the project will involve 184,000 square feet of renovation and 126,000 square feet of new construction over a four-year construction phase. Listed below are several of the sustainability goals identified by the design team at the beginning of the design process: [3]

- Exceed ASHRAE 90.1 (1999) energy performance levels by at least 20%
- Reduce total greenhouse gas emissions for the building complex by 50%, despite a 45% increase in total square footage (much of this to be met by a wood-chip-fired distributed heating system);
- Achieve significant daylighting (2% daylight factor) in 60% of classrooms;
- Generate no net increase in stormwater runoff from the site, despite a significant increase in impervious surfaces;
- Reduce per-square-foot water consumption by 40%;
- Reduce student, teacher, and staff absenteeism by at least 10% compared to prior three years by improving indoor air quality;
- Provide recycling and composting facilities that can achieve an 80% recovery for solid waste generated by the school; and
- Achieve a building that would earn a LEED Silver rating.

Benefits of High-Performance Schools

The benefits of a high-performance school accrue to students, teachers, taxpayers or other supporters of a facility, and the local, regional, and global environment. Eight primary benefits are described below:

1. Improved Student Performance

While data is still limited, there is growing evidence that a school's physical condition—especially its lighting and indoor air quality (IAQ)—can have a direct impact on student performance. The most comprehensive study to date, conducted in school districts in California, Washington, and Colorado, examined the causal relationship between natural daylighting and student performance. In the California district studied, students in classrooms with the most daylight progressed 20% faster on math tests and 26% faster on reading tests over the course of one year compared to students in classrooms with the least daylighting.[4] An earlier, less scientific study in North Carolina produced similar findings

Benefits don't only accrue to new, well-funded schools. Here in Washington, DC, the renovation of the run-down Charles Young Elementary School, completed in 1997, resulted in dramatic improvements in math and reading test scores. Prior to the restoration, almost half of the students scored in the lowest quartile on standardized tests (49% in math and 41% in reading); after the renovation, those percentages dropped to 24% and 25%, respectively.[5]

These studies confirm what teachers, students, and parents have known anecdotally for years: a better facility—one with good acoustics, lighting, indoor air quality, and other high performance features—will enhance learning.

2. Increased Average Daily Attendance

A high-performance school provides superior indoor air quality by controlling sources of contaminants, providing adequate ventilation, and preventing moisture accumulation. Through these strategies, pollutants are kept out of classrooms, stale air is eliminated, and mold growth is inhibited—all of which will keep students healthier and reduce absenteeism, especially among those suffering from respiratory problems. Indoor environments are believed to be a major causal factor of asthma, which is mushrooming in significance and now affects approximately one out of eight children in America.[6] In some states, such as California, a school's operating budget is dependent on the *average daily attendance*, so an increase in attendance boosts the operating budget. The renovation of the Charles Young Elementary School resulted in an increase in student attendance from 89% to 93%.[7] The U.S. Environmental Protection Agency (EPA) has a useful summary of studies addressing indoor air quality and student health.[8]

3. Increased Staff Satisfaction and Retention

High-performance schools are designed to be pleasant places to work. They are visually and thermally comfortable, incorporate good acoustics to minimize distraction, and provide indoor air that is fresh and clean. Such environments become positive factors in recruiting and retaining teachers and in improving overall teacher satisfaction.

4. Reduced Operating Costs

K-12 schools in the U.S. spend approximately $6 billion dollars per year on energy—this is more than they spend on computers and textbooks combined.[9] High-performance schools are designed—using life-cycle costing methods—to minimize long-term costs of operation. They use significantly less energy and water than conventional schools and are designed to be easier to maintain. Many high-performance schools built over the past several years are realizing energy savings of 40% or more. A

school in Iowa is even using windmills to generate more power than it uses and will soon be supplementing its operating budget with this revenue stream! The benefits of reduced operating costs in high-performance schools will continue throughout the life of the buildings.

5. Reduced Liability Exposure

Because high-performance schools are healthy, they reduce a school district's liability exposure over health-related lawsuits. In the past few years, a number of highly publicized school closings, such as that of the McKinnely School in Fairfield, Connecticut, have occurred due to mold problems. The high cost of remediation in schools with IAQ problems (often a quarter-million dollars in a school) are reason alone to do it right the first time. While we still have a lot to learn about such building science issues as mold and moisture control, high-performance schools are generally designed with much greater attention to these issues than conventional schools.

6. Reduced Environmental Impacts

High-performance schools are designed to have low environmental impact. They use energy and water efficiently. They use durable, nontoxic materials that are high in recycled content and can themselves be recycled. Attention is paid to protecting wetlands and natural areas on the school grounds, and efforts are made to allow stormwater to infiltrate into the ground, replenishing groundwater, rather than being carried off site in storm sewers. Many of these schools are being built to use non-polluting, renewable energy systems to the greatest extent possible. Wastes are minimized or recycled during construction. And the schools are designed to facilitate recycling of waste during operation. Through measures such as these, high-performance schools are good environmental citizens.

7. Using the School as a Teaching Tool

Schools are places of learning, and many of the technologies and techniques used to create high-performance schools can also be used as teaching tools. Renewable energy systems—solar, wind, and biomass—are ideal hands-on demonstrations of scientific principles. Mechanical and lighting equipment and controls can illustrate lessons on energy use and conservation. Daylighting systems can help students understand the daily and yearly movements of the sun. Wetlands and other natural features on a school grounds can be used as outdoor laboratories.

The Alliance to Save Energy, of which Senator Jeffords is vice-chair, has offered since 1996 a tremendous program encouraging energy savings in existing buildings. Their Green Schools Program gets students involved with assessing energy issues in their schools, implementing changes, and monitoring the results.[10] Through this program, schools in Pennsylvania, new York, and Washington saved an average of $7,700 per year on energy bills (10-15%) with no expenditure.

8. Schools as Disaster Shelters

Schools often play a role in a community's disaster planning—serving as storm shelters, central collection points during evacuations, or emergency housing during extended power outages. High-performance school buildings built to incorporate natural daylighting, highly energy-efficient envelope systems, and renewable power generation can function far better during power outages than conventional buildings.

High-Performance Schools: A Few Examples

Described below are a few high-performance schools in operation (or nearing completion) around the country.

Boscawen Elementary School, New Hampshire

Completed in 1996 and located just north of Concord, this elementary school was designed with a special focus on indoor air quality. The school it replaced was so crowded that some classes were held in hallways and the air so bad that people were regularly getting sick; the school was even evacuated once due to foul odors. Designed by the H.L. Turner Group, the 48,000 square-foot school for 400 students was the first in the U.S. to be designed to provide 100% fresh air to the building using a "displacement ventilation" system, controlled by carbon dioxide monitors. Ventilation air flows upward through the classrooms and better air quality is provided with less than half the typical ventilation rates in schools (and much lower fan energy). An energy-efficient building shell is combined with extensive daylighting, energy-efficient electric lighting, and low-VOC materials. An integrated, whole-building design process was used, and, remarkably, construction costs for the building were only $65 per square foot in 1996 dollars (exclusive of site costs).

Edgerly Early Childhood Development Center, Somerville, Massachusetts

Designed by HMFH Architects, Inc. and currently under construction, the 80,000 square-foot Edgerly Center will serve 560 pre-kindergarten through first-grade children in this city outside Boston. Somerville is the most densely populated city in New England, so carving out a site for the school was difficult. The need to share functions with a neighborhood park led to other green considerations for the school. A wide range of energy-saving and sustainability features were included in the design, such as extensive daylighting, high-performance glazings, high insulation levels around the entire envelope, superb acoustical isolation, and low-VOC and natural building materials. With funding from the Massachusetts Green School Pilot Program, a fairly large (25-32 kW) photovoltaic (solar electricity) system will be installed on the school, and a small (400 W) wind turbine will be erected in the community garden at the school. The energy features are projected to reduce energy consumption by 31%, compared with a conventional new school. Total cost of the school is expected to be $152/square foot.

Clearview Elementary School, Hannover, Pennsylvania

Due to be completed this fall, Clearview Elementary School was one of five buildings nationwide selected to represent the United States at the International Green Building Challenge, held last week in Oslo, Norway. This 44,000 square-foot, two-story school, designed by Kimball Architects of Harrisburg, Pennsylvania, is designed to achieve a 40% savings in energy and 30% savings in water, compared with a standard school. Among green design strategies employed in the building are daylighting, a high-performance envelope (high insulation levels and advanced glazings), a ground-source heat pump system, an access-floor system for conditioned air supply, demand-controlled ventilation (with carbon dioxide sensors), extensive use of recycled-content building materials, and use of low-VOC paints and other products. Total construction costs were $133 per square foot, exclusive of site work and design fees. The building is expected to achieve a LEED Silver rating.

Dalles Middle School, Oregon

This 96,000 square-foot school serving 600 middle-school students 80 miles east of Portland opened in September, 2002. Designed by BOORA Architects of Portland and built for $12.5 million, the school features a sophisticated daylighting system with light shelves and light tubes to bring natural light deep into the school interior. The school makes superb use of an unusual resource: groundwater pumped from a nearby hillside to reduce landslide risk. This 58- to 60-degree water is used in a ground-source heat pump that provides both heating and cooling for the school. Natural ventilation is used whenever outside temperatures permit, and a wide variety of recycled-content, locally sourced, and nontoxic building materials were used. Overall savings in annual energy consumption are projected to be 46%, compared with a conventional school. The school was built for $105 per square foot, excluding site work.

Ross Middle School, Ross, California

The original Ross School was built in 1941 and a series of six, fairly haphazard additions had been added over the years to expand capacity. In Phase I of the most recent effort, designed by EHDD Architects and completed in 2000, five existing middle-school classrooms were replaced with nine new classrooms and support facilities on two floors. This addition is heavily daylit. Comfort is maintained using natural ventilation rather than an air conditioning system, saving $200,000 on mechanical equipment (these savings paid for all of the other green features). Considerable attention was paid to material selection to avoid IAQ problems and make use of recycled-content and sustainably sourced materials. For example, 90% of all wood used in the building was certified as sustainably harvested, and arsenic-treated wood was avoided in favor of safer pressure-treated wood.

McKinney Elementary School, Texas

Located near Dallas, Texas and designed by the SHW Group in Dallas, the priorities of this school were quite different from those mentioned above. Because water was a very significant issue, an extensive rainwater harvesting system using the school's roof was designed to provide water for outdoor irrigation. Completed in 2000, the 70,000 square-foot building uses extensive daylighting throughout. Energy-conserving electric lighting technologies are used, native landscaping is emphasized, and a great deal of attention was paid to selection of green building materials. Another key feature at the McKinney School was attention to how building features and elements could be used as teaching tools. The school was named one of the AIA Committee on the Environment Top Ten green buildings for 1999.

Durant Road Middle School, Raleigh, North Carolina

The 149,000 square foot school for 1,300 students was completed in 1995 as one of the first examples of a heavily daylit, "green" school. Some of the daylighting strategies used in this school have been adopted in schools across the country. Designed by Innovative Design, the school, the school is realizing annual savings in energy for lighting, cooling, heating, and ventilation of 50-60 percent. Construction costs came in at $3.6 million under-budget!

Recommendations

The movement to create high-performance, green schools is moving along at a healthy pace. The U.S. Green Building Council, for example, has 32 K-12 schools registered for certification under the LEED rating program.[11] These schools are located in 14 states and represent approximately 4.5 million square feet of floor space. However, compared with the magnitude of school construction occurring today, this is just a drop in the bucket.

American School & University reports in its 28th Annual Official Education Construction Report that $26.7 billion in K-12 school construction was completed in 2001.[12] This was split between new construction (42%), additions (16%), and modernizations (42%). During the period 2002 through 2004, total K-12 school construction is expected to total $108 billion. Nationwide, a total of 6,000 new schools are expected to be built by 2007.[13]

Clearly, a lot of school design and construction is occurring. Each new building will be occupied, hopefully, for 50 to 100 years. For the vast majority of them, very little if anything is being done to ensure that they will be high-performance.

While not by any means a comprehensive list, the following are offered as initial recommendations of how the Federal Government could support the creation of high-performance schools. These recommendations are grouped into several areas.

Research

- Support carefully designed, scientifically based studies to measure the effect of high performance schools on attributes such as academic performance, absenteeism, teacher satisfaction and retention, and operating costs of school buildings (including energy, water, maintenance, and repairs).
- Support building science research to learn more about the causal factors of indoor air quality and moisture problems in buildings. One aspect of this could be the development of a protocol for evaluating what the long-term moisture performance (i.e., mold risk) of a building is likely to be based on its design.
- Support research on IAQ remediation, particularly mold problems, in buildings.
- Support research into advanced mechanical and electrical "packages" that could greatly improve school design and simplify their integration into high-performance buildings. Such systems could include displacement air delivery systems and lighting control systems. Until integrated packages are developed that are pre-engineered and perhaps even pre-manufactured, implementing leading-edge HVAC and lighting systems with require expensive custom engineering. Efforts to encourage manufacturers to invest in the development of such packaged HVAC and lighting systems could be structured like the "Golden Carrot" awards for high-efficiency refrigerators several years ago.
- Support prototype development of high-performance portable (relocatable) classrooms. In some states a high proportion of K-12 students are housed in portable classrooms—one-third of students in California, for example. Portable classrooms today often have poor indoor air quality, low energy performance, and poor acoustic performance.
- Support the development of improved daylighting design tools. According to some architects, the lack of a plug-in module for DOE-2 to accurately model the energy impacts of daylighting is a significant obstacle.[14] Rather than funding development of an end-user tool, federal support

should go into the building blocks of such simulation tools, such as the calculation engine and data sets. Creating design tools that use those components should probably remain the purview of the private sector.

- Support the development of national protocols for quantifying hazardous emissions from building materials.

Education and Technology transfer

- Fund the dissemination of planning guides, design manuals, general information resources for the lay public, and other resources to assist in the creation of high-performance schools on a state and local level. While a few states, such as California, Oregon, Pennsylvania, and Massachusetts, already have effective state-wide programs in place to promote high-performance schools, most states do not. Excellent resources on high-performance schools are already available—from the Sustainable Buildings Industry Council, the California High Performance Schools Program, EPA, and DOE (especially the EnergySmart Schools Program). Support is needed to effectively disseminate these materials through state education departments.
- Fund educational workshops, seminars, and other training programs on high-performance school design and construction.
- Fund the compilation and Internet posting of information on leading examples of high-performance schools. The DOE High Performance Buildings Program maintains a database of high-performance buildings, and includes a category for K-12 schools.[15]
- Fund the creation of regional videos about high-performance schools that can serve to educate school boards and communities about the benefits of such practices. The State of Pennsylvania has just produced a superb half-hour program.[16]

Support of High-Performance School Design and Construction

- Provide flow-through (block grant) funding to state education departments to pay for computer modeling during the design of high-performance schools and commissioning[17] of schools prior to occupancy. Energy modeling and commissioning are two critical steps in the creation of high-performance schools, but they are expenses that are often seen as expendable. Computer modeling for a moderate-sized school may cost $10,000 to $15,000 and commissioning can cost from one-half to one-and-one-half percent of the total construction budget. The Healthy and High Performance Schools component of the 2001 Education Bill provides a mechanism for this, but additional funding is required for that effort to reach its potential.

Support of a Collaborative Effort to Advance High-Performance Schools

- Fund the development of a LEED for Schools Application Manual. This could be a collaborative effort among the U.S. Green Building Council, the California High Performance Schools Program, the Sustainable Buildings Industry Council, and perhaps other organizations. The LEED program provides a third-party mechanism for certifying the "greenness" of buildings. This third-party verification is very important in ensuring that the best of intentions on the part of a school board or community are really turned into the best building.

Summary

More than any other type of building, schools are an investment in our country's future. We are in a period of dramatic growth in the number of schools, and that offers a tremendous opportunity to improve these places of learning even as we significantly reduce their use of energy and other resources. We know how to do that. Dozens of high-performance schools have been being built over the past few

years and many more are on the drawing boards. But for high-performance features to be incorporated into all schools, we need to identify key leverage points and assist at these points. Integrated, whole-systems design is the mechanism to do that, and the Federal government can do a great deal to make that available to school systems nationwide.

I thank you, Senator Jeffords and Committee members, for this opportunity to address these issues today. I look forward to following the high-performance schools agenda and would be glad to follow up on any of these ideas with Committee staff. I am sure that the two organizations I represent, the U.S. Green Building Council and the Sustainable Buildings Industry Council, would also be happy to provide additional information at any time.

Respectfully submitted,

Alex Wilson, president
BuildingGreen, Inc.

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[1] *Best Practices Manual, Volume I – Planning*, the Collaborative for High Performance Schools, , 2001.

[2] *High Performance School Buildings: Resource and Strategy Guide*, Sustainable Buildings Industry Council, Washington, DC, 2001.

[3] *BUHS/BAMS/SVCEC – Renovations & Additions: Project Feasibility Report*, Truex Cullins & Partners, May, 2002.

[4] "Daylighting in Schools: An Investigation into the Relationship Between Daylighting and Human Performance," by the Heschong Mahone Group for Pacific Gas & Electric, August, 1999. A follow-up Re-Analysis Report released in February, 2002 responded to technical questions that had been raised by reviewers and verified the original results. Reports available at www.h-m-g.com and www.newbuildings.org/PIER.

[5] "Healthy School Environment and Enhanced Educational Performance: The Case of Charles Young Elementary School, Washington, DC," by Dr. Michael A. Barry, prepared for the Carpet and Rug Institute, January, 2002.

[6] 1999 data from the American Lung Association showing an incidence of 121.8 asthma cases per 1,000 among people aged five to 17. This age group has the highest incidence rate of asthma, well above the average for all people (90.0 cases per 1,000). "Trends in Asthma Morbidity and Mortality," American Lung Association, Epidemiology and Statistics Unit, February, 2002.

[7] "Healthy School Environment and Enhanced Educational Performance: The Case of Charles Young Elementary School, Washington, DC," by Dr. Michael A. Barry, prepared for the Carpet and Rug Institute, January, 2002.

[8] EPA Office of Indoor Air Quality, http://www.epa.gov/iaq/schools/perform.html.

[9] Alliance to Save Energy, www.ase.org.

[10] Alliance to Save Energy, www.ase.org/greenschools.

[11] U.S. Green Building Council, LEED Building Registration List, 23 September, 2002.

[12] "28th Annual Official Education Construction report," *American School & University*, May 2002; www.asumag.com.

[13] *High Performance School Buildings: Resource and Strategy Guide*, Sustainable Buildings Industry Council, Washington, DC, 2001.

[14] Personal communication with Mike Nicklas, FAIA, of Innovative Design, a North Carolina firm well-known for designing daylit schools.

[15] See http://www.eren.doe.gov/buildings/highperformance/case_studies/

[16] "Better Places to Learn: Building Green Schools in Pennsylvania," Governor's Green Government Council, www.gggc.state.pa.us.

[17] Commissioning is a quality-assurance step that can be taken prior to occupancy to ensure that building systems are

performing as they were designed. If commissioning identifies problems with the construction of the building, it may be possible to have corrective measures taken at no cost to the school district.

Testimony Presented by Lois Marie Gibbs
Executive Director Center For Health Environment and Justice
October 1, 2002

Thank you for this opportunity to speak with you on an issue that has concerned me for over 20 years. You may be familiar with my involvement in Love Canal, which led to my being termed the "mother of Superfund," the federal Superfund law. What you may not know is that the struggle to relocate the residents of Love Canal began with my concern over the health hazards faced by children at the 99th stre elementary school. The school was built on the perimeter of a toxic waste site and the students, which included my son, were in danger.

Children are powerless against many dangers in school and out, and they look to adults for protection. However, decisions that adults make frequently endanger our nation's children. New schools are being built on or near chemically-contaminated land or near industrial facilities that release toxic emissions tha contaminate the air children breathe, the water they drink and play in and the soil they play in.

There is growing evidence that these chemical exposures—these invisible threats—diminish our children's health and intellectual abilities. Research has revealed increasing numbers of children afflicted with asthma, cancers, lower IQs, and learning disabilities, which impede their ability to develop to their full potential. From birth, children are exposed to toxic chemicals in many ways. Public schools when built on or near contaminated land are a potential source of chemical exposure.

While laws compel children to attend school, there are—astoundingly—no guidelines or laws in place th compel school districts to locate school buildings on property that will protect the school population fron environmental health and safety risks. California is the only state that has some regulations and an assessment process for the building of new schools. Consequently, parents are forced to send their children to some schools that pose a threat to their children's health and ability to learn.

CHEJ has received numerous inquiries from parents who either:

- were concerned about an existing school where there was a higher than expected number of studen with cancer or other diseases;
- found toxic chemicals in the soil of a school campus;
- or were concerned about the construction of a new school on contaminated lands.

In response to these requests, CHEJ decided to bring these parents together to explore the depth of the problem (See attached list of community school contamination situations.). Additionally, we began to undertake research to identify laws that govern such situations. We were stunned to find that there were no laws governing the siting of a school with the exception of California. In fact, we found that there were strict laws and regulations around the construction of homes and commercial buildings but not schools. This raised two fundamental questions for leadership.

1. How many schools are located on or near chemical waste sites or other contaminated sites today?

2. Is there a need for national or statewide legislation that would prohibit building a school on contaminated property or set cleanup guidelines when there is no alternative but to use contaminated property?

To answer these questions, we looked at the location of public schools in five states and overlaid the

location of known federal and state identified contaminated sites. In January we released the results in th Child Proofing Our Communities Campaign's School Siting Committee report *Creating Safe Learning Zones*. In this report, the campaign revealed that 1,195 schools are located within one half mile of a known toxic site in these five states affecting an estimated population of over 620,000 students.

State	Number of Schools	Number of Counties	Estimated Number of Students	Lists Used to Identify Toxic Site
California	43	11	32,865	Superfund only
Massachusetts	818	13	407,229	Superfund & State
Michigan	64	27	20,999	Superfund & State
New Jersey	36	11	18,200	Superfund only
New York	235	39	142,738	Superfund & State
Total	**1,196**	**100**	**622,031**	

Table 1: Number of Public Schools and Students Attending Classes Within a Half-Mile of a Superfund or State-Identified Contaminated Site

Based on the report's findings, we believe there is a critical need for national laws ensuring that the locations for new schools are safe and that, if contaminated property is considered, it is properly cleaned up. The campaign has developed model school siting legislation to promote laws and policies (covering both public and private primary and secondary schools) that protect children's health. Additionally, with the proposal of building over 2,400 new schools in 2003-2005 there is an immediate need to define criter and appropriate funds to ensure that new schools are designed and built to protect children's health.

The following are model school siting guidelines that the Child Proofing Our Communities campaign recommends be considered as part of legislation written to ensure the safety of the school population. This model draws upon existing California legislation (AB 387 and SB 162, 1999) that mandates the California Department of Toxic Substances Control (CDTSC) to perform Preliminary Endangerment Assessment's (PEA's) on proposed school sites.

1. The Establishment of a School Siting Committee

The public body responsible for siting new schools is usually the local school board or a school district committee. This group should establish a school siting committee whose job is to recommend to the public body sites for building new schools and/or expanding existing schools. The committee should include representatives of the public body as well as representatives from the following stakeholders: parents, teachers, school health nurse or director, officials from local health departments, community members, local public health professionals, environmental advocacy groups, and age-appropriate students. Only public bodies who have appointed school siting committees representing such stakeholde should be eligible to receive federal money for the assessment and cleanup of school sites or the construction of new schools.

2. Public Involvement

The public body (the school board or school district committee) should notify parents, school staff,

members of the local community, and "feeder" school parents of the new school's students of plans to build a new school and solicit their participation in writing and at public meetings. This outreach effort should include prominent placement of public notices and feature articles about the proposed plan in commonly read newspapers or local magazines. A notice shall be posted in a conspicuous place in every school within the public body's jurisdiction (in multiple languages if there's a significant number of non-English speaking parents). A copy shall also be delivered to each parent-teacher organization within the jurisdiction, each labor union covered by a collective bargaining agreement signed by the public body, ar each landowner within 1,000 feet of the proposed site. This effort can also be used to recruit participants for candidates for the school siting committee.

3. Categorical Exclusions for School Sites

Under no circumstances should a school be built on top of or within 1,000 feet of a site where hazardous or garbage waste was landfilled, or where disposal of construction and demolition materials occurred. To determine whether the proposed school site has been used for these purposes, an initial Environmental Assessment should be undertaken, and, if necessary, a more extensive Preliminary Endangerment Assessment. If either evaluation reveals that the site has been used for these purposes, or if the site is within 1,000 feet of any property used for these purposes, the site must be abandoned.

4. Process for Evaluating Sites

The public body shall not proceed to acquire a site or prepare a site for construction of any school, including the expansion of an existing school, until the public body completes the required environmental evaluations and the state environmental regulatory agency approves the initial Environmental Assessment. Based on the results of this initial assessment, a more extensive investigation, a Preliminary Endangerment Assessment, may be required. Based on the results of the PEA, a Site Remediation Plan may also be necessary.

A. Initial Environmental Assessment

Once a site is proposed, the school board/district committee must hire a licensed environmental assessor to conduct a three-part environmental assessment that is designed to collect information on current and past site uses and to conduct initial environmental sampling at the site. This assessment shall include:

Part I: **A site history** by reviewing public and private records of current and past land uses; historical aerial photographs; environmental databases; federal, state and local regulatory agencies' files; a site visit; and interviews with persons familiar with the site's history.

Part II: **A small-scale grid sampling and analysis** of soil, soil gases (if any) and groundwater. Air should be sampled if stationary or mobile sources of air pollution are near the proposed site, potentially exposing children to higher levels of pollution than found in their own communities. Any surface water should also be sampled.

Part III: **Identifying any environmental hazards within two miles of the site**, including industrial sites, chemical storage facilities, facilities found in EPA's Toxic Release Inventory (TRI), waste treatment plants, landfills, military sites, research facilities, and Department of Energy sites.

If the Initial Environmental Assessment concludes that the site was previously used for hazardous or garbage waste disposal, or for disposal of construction and demolition materials, or if it is within 1,000 feet of any property used for these purposes, the site must be abandoned.

If some contamination is discovered, the levels found should be compared to a list of cleanup guidelines developed by the New York State Department of Environmental Conservation (see table 2 and discussion below). If contaminant levels exceed any of these values, a more extensive site assessment – a Preliminary Endangerment Assessment (PEA) - is necessary.

A Preliminary Endangerment Assessment would also be necessary if the Initial Environmental Assessment found that the proposed school site lies within 1,000 feet of one of the following potential sources of contamination:

- A suspected hazardous, industrial, or municipal waste disposal site
- Refineries, mines, scrap yards, factories, dry cleaning, chemical spills, and other contaminants
- Agricultural land
- Dust generators such as fertilizer, cement plants, or saw mills
- Leaked gasoline or other products from underground storage tanks
- Concentrated electrical magnetic fields from high intensity power lines and communication towers
- Areas of high concentrations of vehicular traffic such as freeways, highways
- Industrial plants and facilities
- An USEPA or state designated Brownfield site
- A railroad bed
- An industry listed in EPA Toxic Release Inventory (TRI)

If no environmental hazards were identified at the property then the property would be considered suitable for school site development.

The state environmental regulatory agency must review the final draft of the Initial Environmental Assessment. Depending on the thoroughness of the assessment, the state agency would either give preliminary approval to the assessment, disapprove the assessment, or request more information.

When the final draft of the Initial Environmental Assessment is complete and has received preliminary approval by the state environmental regulatory agency, the public body shall publish a notice in newspapers of general circulation (including foreign language newspapers if the school district has a sizable number of non-English speaking parents) that includes the following information:

> A statement that an initial Environmental Assessment of the site has been completed; a brief statement describing the results of the assessment such as a list of contaminants found in excess of regulatory standards; prior uses of site that might raise health and safety issues; proximity of site to environmental hazards (waste disposal sites, point sources of air pollution, etc.); a brief summary of the conclusions of the initial Environmental Assessment; the location where people can review a copy of the assessment or an executive summary written in the appropriate foreign language; and an announcement of a thirty-day public comment period including an address where public comments should be sent.

A copy of this notice shall also be posted in a conspicuous place in every school within the public body's jurisdiction (in multiple languages if there is a significant number of non-English speaking parents). A copy shall also be delivered to each parent-teacher organization within the jurisdiction, each labor union covered by a collective bargaining agreement signed by the public body, and each landowner within 1,000 feet of the proposed site.

The state environmental regulatory agency will review all comments received on the Initial

Environmental Assessment. This agency will then accept or reject the conclusion of the assessment, determine whether the site can be used without further remediation or study, whether the site is categorically excluded for use as a school, or whether further study or remediation of the site (i.e., a Preliminary Endangerment Assessment) is required. The state environmental agency shall explain in detail the reasons for accepting or rejecting the assessment.

After the state environmental agency has approved the Initial Environmental Assessment, the local Schoc Siting Committee must also review the assessment and public comments received. The purpose of this review is for the School Siting Committee to make a recommendation to either abandon the site or continue evaluating the environmental hazards at the site with a Preliminary Endangerment Assessment c PEA.

If a PEA is required, the School Siting Committee should recommend to the public body whether to abandon the site or proceed with a PEA. Alternative sites should be considered at this point. Then, the public body must vote whether to abandon the site or proceed with a PEA.

B. Preliminary Endangerment Assessment

A Preliminary Endangerment Assessment (PEA) is an in depth assessment of the environmental contamination present at a site. A licensed environmental assessor must do this assessment. The state environmental regulatory agency shall oversee the PEA process and issue regulations that prescribe the precise contents of the PEA. A model for such regulations can be found in California, where the PEA must meet the California Department of Toxic Substances Control Preliminary Environmental Assessme Guidance Manual requirements (CEPA, 1994). The PEA must also be approved by the state environmental regulatory agency.

Before any work is done on the PEA, the public body must develop a public participation plan that ensures public and community involvement in the PEA process. The plan shall indicate what mechanisms the public body will use to establish open lines of communication with the public about the use of the site as a school. Activities such as public meetings, workshops or fact-sheets may be appropriate ways to notify the public about the proposed PEA investigation activities (such as the taking of soil, groundwater and air samples) and schedules. The state environmental regulatory agency must approve the public participation plan before the public body can commence other PEA-related activities.

The primary objective of the PEA is to determine if there has been a release or if there is a potential for a release of a hazardous substance that could pose a health threat to children, staff, or community members. As part of the PEA, full-scale grid sampling and analysis of soil, soil gases (if any) and groundwater shall be undertaken to accurately quantify the type and extent of hazardous material contamination present on the site. The PEA will also contain an evaluation of the risks of actual or potential contamination posed to children's health, public health, or the environment based on the contamination found. The evaluation of risks shall include:

- A description of health consequences of long-term exposure to any hazardous substances found on site;
- A description of all possible pathways of exposure to those substances by children attending school on site; and
- The identification of which pathways would more likely result in children being exposed to those substances.

The PEA shall conclude that 1) there are no environmental hazards at the site which must be abated

through a cleanup plan; or 2) the site was previously used for hazardous or garbage waste disposal, for the disposal of construction and demolition materials, or is within 1,000 feet of any property used for these purposes (the categorical exclusion); or 3) the site must be cleaned up if it is to be used for a school. If the site was previously used for hazardous or garbage waste disposal, for the disposal of construction and demolition materials, or is within 1,000 feet of any property used for these purposes, the site must be abandoned. If the site must be cleaned up, the PEA shall identify alternatives for cleaning the site to meet the applicable safety standards.

The state environmental regulatory agency must review the final draft of the PEA. Depending on the thoroughness of the assessment, the state agency must give preliminary approval to the assessment, disapprove the assessment, or request more information.

When the final draft of the PEA is completed and has received preliminary approval by the state environmental regulatory agency, the public body shall publish a notice in newspapers of general circulation (including foreign language newspapers if the school district has a sizable number of non-English speaking parents) that includes the same information released for the Initial Environmental Assessment:

- A statement that a PEA of the site has been completed;
- A brief statement describing the results of the PEA, such as a list of contaminants found in excess of regulatory standards, prior uses of site that might raise health and safety issues, proximity of site to environmental hazards (waste disposal sites, point sources of air pollution, etc.);
- A brief summary of the conclusions of the PEA;
- The location where people can review a copy of the PEA or an executive summary written in the appropriate local language(s); and
- An announcement of a thirty-day public comment period, including an address where public comments should be sent.

As described for the Initial Environmental Assessment, a copy of this notice shall also be posted in a conspicuous place in every school within the public body's jurisdiction (in multiple languages if there is a significant number of non-English speaking parents). A copy shall also be delivered to each parent-teacher organization within the jurisdiction, each labor union covered by a collective bargaining agreement signed by the public body, and each landowner within 1,000 feet of the proposed site.

The state environmental regulatory agency will review all comments received on the PEA. The state environmental agency shall then either accept or reject the conclusion of the PEA, determine whether the site can be used without further remediation or study, whether the site is categorically excluded for use as a school, or whether a Site Remediation Plan is required. The state environmental agency shall explain in detail the reasons for accepting or rejecting the PEA.

After the state environmental agency has approved the PEA, the local School Siting Committee must also review the assessment and public comments received. The purpose of this review is for the School Siting Committee to make a recommendation to either abandon the site or consider remediation. Alternatives should be considered at this point. Then, the public body must vote whether to abandon the site, proceed with a remediation plan, or consider an alternative site or option.

If the PEA indicates that the site has a significant hazardous contamination problem, the public body must either abandon the site or fund a cleanup plan that would reduce contaminant levels to the applicable safety standard for each contaminant. The public body must abandon the site if the PEA uncovers that the site was previously used for hazardous or garbage waste disposal, for disposal of construction and demolition materials, or is within 1,000 feet of any property used for these purposes.

C. Child Protective Health Based Standards

The Child Proofing Our Communities campaign found that no health-based child-sensitive standards exist at the federal, state, local, or any level for determining "safe" levels of contamination in soil that will protect children. Lacking such standards, parents, school districts, regulating agencies, and others are lost as to how to evaluate contamination at new or existing sites. Until such standards are developed, the campaign recommends the use of the New York State (NYS) Recommended Soil Cleanup Objectives. These values were developed to provide a "basis and procedure to determine soil cleanup levels" at state and federal superfund and other contaminated sites in the state.

The Child Proofing Our Communities campaign, in conjunction with environmental engineers we convened at a Children's Environmental Health Symposium earlier this year, reviewed the cleanup standards or guidelines for several states and found the NYS values to be generally lower than all others considered. A subcommittee of professional engineers and health scientists who participated in the Symposium concluded that the NYSDEC list is a good, reasonably sound, and conservative list to use as an initial screen to provide school boards/districts with a way to evaluate sites early on in the site selection process.

A table of 27 common contaminants from the NYS list of Recommended Soil Cleanup Objectives is included below. The entire list provides guidelines for 126 contaminants.

New York State Recommended Soil Cleanup Objectives For Chemicals Commonly Found at Contaminated Sites

Solvents		Pesticides/other		Metals	
acetone	0.2	aldrin/dieldrin	0.041	arsenic	7.5
benzene	0.06	chlordane	0.54	barium	300
2-butanone	0.3	chrysene	0.4	cadmium	1
carbon tetrachloride	0.6	DDT/DDE	2.1	chromium	10
chloroform	0.3	naphthalene	13.0	lead	400
1,1-dichlororethane	0.2	pentachlorophenol	1.0	mercury	0.1
1,2-dichloroethane	0.1	PCBs 1.0		nickel	13
methylene chloride	0.1				
tetrachlorethene	1.4				
trichloroethene	0.7				
toluene	1.5				
vinyl chloride	0.2	Note: All values are in parts		per million (ppm)	
xylene	1.2				

D. Site Remediation Plan

If the school board/district decides to proceed with cleanup of the proposed site, a Site Remediation Plan must be developed. This plan must:

- Identify alternative methods for cleaning the site to contamination levels that meet the applicable safety standards;
- Contain a financial analysis that estimates and compares soil cleanup costs for the identified alternative cleanup methods that will bring the site into compliance with applicable safety standards;
- Recommend a cleanup plan from the alternatives identified;
- Explain how the recommended cleanup alternative will prevent children from being exposed to the hazardous substances found at the site; and
- Evaluate the suitability of the site in light of recommended alternative sites and alternative cleanup plans.

The public body shall submit the Site Remediation Plan to the state environmental regulatory agency for approval. Before submitting the plan for approval, a draft remediation plan shall be given to the School Siting Committee for review and comment. Once the remediation plan is submitted to the state agency for approval the public body shall proceed with a public notification and outreach plan similar to that conducted for the Initial Environmental Assessment and the Preliminary Endangerment Assessment. This would include publishing a notice in newspapers of general circulation (including foreign language newspapers if the school district has a sizable number of non-English speaking parents) that includes the following information:

- A statement that a site remediation plans has been submitted to the state environmental agency for approval;
- A brief statement describing the site remediation plan, including a list of contaminants found in excess of regulatory standards and a description of how the plan will reduce the level of contamination to meet those regulatory standards;
- The location where people can review a copy of the remediation plan or an executive summary written in the appropriate local language(s); and
- An announcement of a thirty-day public comment period and the address of the state environmental agency where public comments should be sent.

A copy of this notice shall also be posted in a conspicuous place in every school within the public body's jurisdiction (in multiple languages if there is a significant number of non-English speaking parents). A copy shall also be delivered to each Parent-Teacher Organization within the jurisdiction, to each labor union covered by a collective bargaining agreement signed by the public body, and each landowner within 1,000 feet of the proposed site.

At least thirty days after the conclusion of the public comment period the state environmental regulatory agency shall conduct a public hearing on the remediation plan in the neighborhood or jurisdiction where the proposed site is located.

The state environmental agency shall publish a notice of the hearing in newspapers of general circulation (including foreign language newspapers if the School district has a sizable number of non-English speaking parents) stating the date, time and location of the hearing. The state environmental regulatory agency shall provide translators at the public hearing if the school district has a sizable number of non-English speaking parents.

After the public hearing and after reviewing any comments received during the public comment period the state environmental regulatory agency shall either approve the Site Remediation Plan, disapprove the Site Remediation Plan, or request additional information from the public body. If the state agency requires additional information, a copy of the letter requesting additional information shall be sent to the School Siting Committee. Any additional information submitted by the public body to the state environmental regulatory agency shall also be given to the School Siting Committee. After reviewing any additional information, the state environmental regulatory agency must approve or reject the Site Remediation Plan. The state environmental agency shall explain in detail the reasons for accepting or rejecting the Site Remediation Plan.

After the state environmental regulatory agency approves the Site Remediation Plan, the local School Siting Committee must also review the plan and recommend to the public body whether to abandon the site or proceed with acquiring the site and implementing the remediation plan. Alternative sites or optior should be considered at this point. The public body must then vote whether to abandon the site or to acquire the site and implement the remediation plan. Only upon voting to acquire the site and implement the remediation plan may the public body take any action to acquire the site and prepare the site for construction of a school.

4. Guidelines Appropriate to Children's Health

The Child Proofing Our Communities campaign believes that the USEPA is best suited to issue such guidelines related to assessment and cleanup of these sites. We feel strongly that Congress should requir the EPA to determine proper cleanup guidelines to reduce the risk of exposure for children. It has also been the campaign's experience that the levels of cleanup vary widely from site to site—the determining factor often being the economic status of the particular community. The campaign strongly urges the EPW committee to mandate EPA to establish a minimum standard that all cleanup plans must adhere to. Towards that end we have begun a process of convening a panel of children's environmental health professionals to identify cutting edge health information such as neurodevelopmental and reproductive effects in children that have been associated with exposure to toxic chemicals and to identify how to incorporate this information into the process of setting health based exposure standards for children. The campaign would be pleased to share the results of our investigation with the EPA to inform future efforts in arriving at children's environmental health guidelines.

5. New School Construction

It makes little sense to build an environmentally dangerous school on a newly cleaned site. We

recommend the availability of funds to build healthy "green" schools.

There are no federal laws governing the environmental health conditions in schools. The EPA has been the most responsive agency, producing tools that individual schools can use to diagnose and correct indoo air quality problems. Much more needs to be done, however, to eliminate the many avoidable environmental health impacts present in the school environment. A promising federal bill—the Healthy High Performance Schools Act (2001)—and health and safety grants for emergency school renovations (2000) have had support or funding withdrawn. Thus we are left with the odd result that the federal government tolerates unhealthy construction practices and materials usage in schools even as it spends funds to diagnose and correct the resulting problems after the fact.

We advocate the availability of funding for both the aforementioned programs in order to promote "green building" practices in school construction and renovation. Presently there are no national standards that use green building materials and techniques. Some federal agencies such as the Department of Transportation and the Department of Interior are attempting to utilize the LEED (Leadership in Energy & Environmental Design) program developed by the U.S. Green Building Council. Unfortunately LEED does not effectively address children's environmental health concerns. As a first step, we recommend that a study of applicable green building standards and policies be undertaken to identify those best serving the goal of protecting children's health.

6. Federal Funding

There is only one state (California), which has a law that provides some siting guidelines. However, there is little funding available to put the legislated guidelines into practice. Therefore, we are advocating for federal funding of the appropriate agencies to support schools that apply for the assessment, remediation, and construction of 'healthy' schools on otherwise untenable sites. Without adequate resources the local school authorities cannot adequately assess the property nor clean the property to a standard that is protective of children.

FINDINGS

- Hundreds of schools nationwide have been built on or near contaminated land
- Taxpayers provide billions of dollars for cleanup, construction of replacement schools, and medical treatment of disease in exposed children

The Child Proofing Our Communities campaign has provided these examples of schools disastrously impacted by their proximity to toxic waste sites:

1. Love Canal, Niagara Falls, NY—Toxic Waste Dump

Most know of the Love Canal dumpsite disaster in Niagara Falls. Twenty thousand tons of chemicals were buried in the neighborhood's center and eventually leaked out into the surrounding community. The 99th Street Elementary School was on the dump's perimeter, and the 93rd Street School was just two blocks away. Both closed in 1978 after extensive testing revealed high levels of chemical contamination on and around them. Love Canal was the first community to close schools due to potential health risks to children.

2. Los Angeles, CA—Former Oilfield and Industrial Site

The Belmont Learning Complex was proposed in 1985 by the Los Angeles Unified School District as a middle school to alleviate overcrowding in a mostly poor, Latino neighborhood. The project ballooned into a proposed 35-acre, state-of-the-art, high school campus, with classrooms and innovative "academies" for 5,000 students. More than fifteen years later, the half-built brick building stands abandoned. Parents learned what the school district already knew—explosive methane gas, poisonous hydrogen sulfide, volatile organic compounds such as acetone, the carcinogen benzene, and residual crude oil existed on the location, a former oilfield and industrial site.

The project, halted in 2000, is now underway again, with over $174 million already spent. After extensive debate about children's health issues, community support for completing the school remains strong. In this instance especially, the contentious process would have been prevented if effective school siting legislation had been in place that emphasized health concerns first and foremost and required assessment and remediation to occur before the expensive construction actually began.

2. Marion, Oh—Military Dump

The River Valley Middle and High schools sit on the former site of the U.S. Army's Marion Engineer Depot, and was used as the facility's dumping ground from 1942-1961. In 1997, community members formed a group, Concerned River Valley Families, in response to alarming rates of leukemia and other rare cancers among former students. The group's efforts led to an investigation that revealed widespread contamination from toxic materials dumped for nearly two decades. Students were and continue to be exposed to potentially harmful concentrations of solvents, such as trichloroethylene (TCE) and benzo(A) pyrene, polynuclear aromatic hydrocarbons (PAHs), and heavy metals in the soil surrounding the schools. Many of the solvents are known carcinogens and some have been linked to leukemia.

In November of 2000, River Valley school district Marion voters passed a bond and Congress passed precedent-setting legislation that together would provide enough money to build new schools away from the military dumping grounds. To date, there has been an emergency arsenic removal, and access has been restricted to the polluted athletic fields and the middle school back doors, but air pathways still have not been fully or adequately characterized.
The schools remain open although reservists are not allowed on the adjacent Army Reserve training grounds. The new schools approved by residents and Congress will not be open until at least August 2003, but the school board refuses to temporarily move their students to an environmentally safe facility.

4. Providence, RI—Two New Schools On a Dump, with More Planned

Parents were shocked when bulldozers showed up without warning to begin construction of Springfield Elementary School on the grounds of what had been a city landfill for at least 25 years. The Hartford Park Tenants Association and other community parents have filed a lawsuit against the school board, City of Providence, and State Department of Environmental Management. They argue that building a school for minority students on a landfill is a violation of the children's civil rights. These students already have high rates of asthma and lead poisoning. The groups also contend that they were not given enough notice about the building of the new school to allow them to play a role in the site selection and remediation process.
The groups have concerns about the state-approved soil gas removal process that has placed an elaborate system of monitors and underground pipes beneath the school to prevent the accumulation of explosive methane gas. Their primary concern is the potential for explosion, but they are also worried the about

the odors coming from the stack that releases soil gases on school property. They want the school shut down.

During the construction of a middle school next to the elementary school, parents won a temporary order halting work while children were outside the elementary school in order to prevent their exposure to contaminated dust. Now that Springfield Middle School has opened, a court has ordered the city to notify the plaintiffs in the lawsuit when environmental testing is done so that plaintiffs' experts can observe the testing. The city must also share the results of the environmental tests with the plaintiffs.

5. Tucson, AZ—Industrial Plants

Sunnyside Elementary and Junior High Schools serve primarily Mexican-Americans in Tucson's Southside. Many who attended during and after the 1950s later developed cancers and leukemia. By 1981, area wells used by these schools and many nearby homes were shut down due to industrial contamination from a groundwater plume of trichloroethylene (TCE) and other toxins migrating from military-related industries. Residents formed Tucsonians for a Clean Environment and won local support for environmental health projects, including a health clinic for persons poisoned by TCE.

Today Tucson's Southside faces a new toxic threat from a military contractor. In 1983, Brush Wellman built a facility near Sunnyside High School, Sierra Middle School, Los Ranchitos, and Los Amigos Elementary Schools. This facility processes beryllium, a lightweight metal the military uses that causes a fatal and incurable lung disease. Twenty-five employees at the plant already have the disease. Beryllium traces have been found on Los Amigos and Los Ranchitos grounds, putting young schoolchildren at risk. The community is asking that Brush Wellman install air monitors on school grounds and around the neighborhood, but they have had no progress thus far.

6. New Orleans, LA—Garbage Dump

Residents of Gordon Plaza—1,000 low- and middle-income African Americans—discovered only after tl moved in that they were living on the former Agriculture Street Landfill—the city's municipal waste dun more than 50 years. The landfill was never properly capped, and residents began almost immediately to d trash and building debris in their back yards.

Construction of Moton Elementary School—intended to serve 850 students from Gordon Plaza and a nea housing project—was completed in 1987 despite residents' concerns about high levels of lead and other t at the school site. During the three years the school was open, children and staff were sick with rashes, vomiting, respiratory problems, and headaches, and plumbing problems made it impossible to use the sch cafeteria and toilets. In 1990, the superintendent overruled the school board and shut the school down.

The U.S. EPA added Agriculture Street to Superfund in 1994 and began a $20 million cleanup of the site 1998, replacing two feet of soil while residents remained in their homes, exposed to contaminated dust throughout months of cleanup work.

Moton Elementary School reopened in September of 2001. In some areas on the school grounds, only six inches of soil were replaced. Despite its history, 900 students currently attend the school.

7. Corry, PA—Industrial Plant Emissions

The school board in Corry decided to consolidate four of five small elementary schools into one large

school housing over 1,000 students. The chosen site sits next to Foamex, a polyurethane foam manufacturing plant that ranks second statewide for hazardous air emissions, annually dispersing approximately two million pounds of hazardous chemicals into the year. Additionally, toluene diisocyanate (TDI) and methylene chloride are used in the manufacturing process and are stored in large quantities on the site. Both are known carcinogens. Suspected TDI health effects include respiratory, immunological, and neurological disorders. Methylene chloride is suspected of harming the reproductive, neurological and respiratory systems.

The community is unified against the consolidation and has collected 2,000 signatures in support of finding another site. Meanwhile, the consolidation did not occur and the construction of a new school seems doubtful.

8. Jacksonville, FL—Incinerator-Ash Dump

This predominantly African-American community suffers from a long history of industrial contamination. From 1943 to 1969, four sites served as incinerator-ash dumping grounds. The ash contained high levels of lead, dioxins, and PCBs. While environmental agencies knew about the situation as early as 1985, parents and other residents were only informed in 1999.

As the 1999-2000 school year began, many parents, including the president of the PTA, withdrew their children from Mary McLeod Bethune Elementary School, which was built on one site where testing revealed high levels of dioxin. The school was closed in 2001 as part of an EPA-ordered cleanup. Community activists are now pressing for closure and cleanup of a park built on another ash site.

9. Houston, TX—Industrial/Chemical Complex

To relieve overcrowding, the city council created a special taxing district to help cover the $76 million cost of constructing a new school in a predominantly Latino area. The re-proposed school was opened in 2001 and named for Cesar Chavez. The modern, fully-equipped facility with enough computers, laboratories, sport fields, and classrooms for 3,000 students is located in an industrial zone on a site previously occupied by an auto salvage yard, a dry cleaner and a chemical toilet company. The school is a quarter mile from Texas Petrochemicals, Exxon-Mobil, and Goodyear Tire and Rubber, and 1.2 miles from a Lyondell Citgo Refining facility. These plants release nearly five million pounds of hazardous chemicals into the air annually. A major accident at any one of these chemical plants would endanger students at the school. The underground pipelines from the plants that cross the school's property pose an additional threat.

10. Quincy, MA – Shipyard Toxics

Residents from Quincy formed Quincy Citizens for Safe Schools and helped defeat city plans to build a high school on a four-acre site that was contaminated with wastes from a neighboring shipyard. The city knew the site was contaminated with asbestos, lead, PCB's and other chemicals but believed it could be cleaned. When parents and other residents became aware of the plan, they vehemently opposed it and circulated a petition to stop it. Eventually, the mayor and some city council members who had promoted the project were defeated in elections by candidates who opposed the plan.

11. Detroit, Michigan – Former Industrial Site

In July 2000, the Detroit Public Schools (DPS) broke ground on the first new elementary school to be built in the city in decades. Unfortunately, the New Beard School, which would serve the largest concentration of Hispanic students in the city, was sited on a former industrial property contaminated

with unsafe levels of lead, arsenic, PCBs, carbon tetrachloride, cyanide, and other toxic materials. Rather than removing these contaminants from the site, DPS chose to install a crushed concrete and soil exposure barrier intended simply to prevent children from touching the contaminated soils. When initial efforts to convince DPS to listen to their concerns failed, parents filed a civil rights/environmental justice lawsuit to prevent the school from opening until the site's safety could demonstrated. After a four-day evidentiary hearing, a federal judge allowed the school to open, but required DPS to take additional precautions, which included conducting additional soil and soil gas sampling, hiring an independent environmental consultant (IEC) to make recommendations regarding the need for additional testing and/or monitoring at the site, and establishing a citizens' advisory committee to oversee the IEC's work. DPS has implemented several but not all measures recommended by the IEC, but the Beard administration continues to balk at some precautionary steps, such as installing a permanent plaque at the school warning that about the contamination that lies beneath the exposure barrier.

Conclusion

We are truly at a critical juncture. Public elementary and secondary enrollment is rapidly growing and is expected to reach an all-time high of 44.4 million by the year 2006. At least 2,400 more schools are needed in the next few years to accommodate this increase. If action isn't taken immediately, these new schools will continue to be built without guidelines to protect children against chemical exposures. Failu to act could place tens of thousands of children at risk of being exposed to toxic chemicals at their place learning. Society can no longer allow innocent children to be placed in harm's way due to inexcusably b decisions by local school district decision makers.

Thank you very much for considering our views in the formation of legislation to improve children's environmental health through intelligent and comprehensive school siting.

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Statement of Veronika Carella, Concerned parent and children's advocate
3124 Longfield Road, Glenwood, Maryland 21738
September 27, 2002

BACKGROUND

Children have the right grow to their full potential, both academically and physically. Children have the right to a free and safe public education. For some families, these goals are growing increasingly difficult and sometimes impossible obtain, because of the conditions that they face in their school environment. I urge this committee to address the concerns presented today and safeguard our children while they attend school.

I respectfully present testimony as the parent of two children seriously and permanently injured by exposure to hazardous materials sustained while they attend public schools in Maryland. My children unknowingly became hyper-sensitive to pesticides and some hazardous chemicals due to unintentional exposure at school to EPA-registered pesticides and other hazardous materials when they were young (1995-1998). The resulting injuries have caused them to suffer serious illnesses and a significant number of schools days. As a family, we struggle with the physical, emotional and economic effects of their conditions everyday since they were exposed to these hidden school environment hazards.

Sadly, ours is not an isolated case. As a children's advocate and active PTA member in the State of Maryland, I have seen, heard, documented and testified to many horror stories from other families who suffer needlessly from harmful products used in their children's school environments.

NEED FOR LEGISLATION

There is no system to protect children. We have personally found that school only do what they are legally required to do. Ironically, because of the lack of legislative protections and funds to adequately maintain our public schools, my children and others continue to be exposed to known hazardous conditions and toxic products in their public schools. The resulting injuries are unnecessary and pose an unacceptable risk to their potential to live full and healthy lives as adults.

Parents are required by law (Maryland) to send their children to public school, yet there is a distinct lack of legislative protection both on the state and federal level to safeguard children while they are at school. Parents appear to be powerless to protect their children from known hazards in the school setting, thus schools environments continue to injure innocent and unsuspecting children and staff.

Every day there is the potential for chemical exposures. Public school students staff face hidden chemical assaults every day. Children's small growing bodies cannot always process or tolerate the chemicals that we all use in our every day world. This is especially true for certain hazardous pesticides, cleaning products and paints by many school systems. Lower risk alternatives must be made available.

NEED FOR FUNDING

Solutions exist. However, without legislation, school will not implement them. Without funding schools sometimes cannot implement them. There is a need for legislation and adequate funding to support such solutions such as least-toxic Integrated Pest Management (IPM) where school maintenance and repair reduce and often eliminate the need for chemical pest control methods. Without funding, search cannot continue on identifying low risk alternatives to the products we

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know have the potential to harm our children.

I strongly encourage you to promptly fund and to implement the Healthy and High Performance Schools Act and strengthen EPA's school environment programs. Thank for your time and consideration.

Respectfully submitted by:

Veronika Carella
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September 27, 2002

Testimony to US Senate Environment and Public Works Committee
Hearing on Green Schools
Tuesday October 1, 2002
The Funders' Forum on Environment and Education
Geri Unger; E-mail geri@f2e2.org

Schools provide the opportunity for advancement of knowledge and creation of a civil society. The type of school facility that we provide out children is indicative of the care and respect we hope they will grow with. Schools must be safe, healthy and inspirational places for study. The full funding and implementation of the Healthy High Performance Schools Provision of the Leave Nor Child Behind Act will lead the way in insuring that every child in the USA has a seat in a school which is:

- **Healthy**
- **Economic**
- **Environmentally friendly or "green"**
- **Community Centered**
- **Open to creative learning opportunities**

Studies conducted over the last decade have shown that healthy schools, with proper ventilation, lighting, and high indoor air quality, make a positive difference in the health and academic performance of the children attending them.[1] Despite these documented results, both existing and new schools fail to provide students and staff with healthy and academically conducive buildings. The US Department of Education in its 1999 report on the Condition of American Public Schools Facilities surveyed some 78,300 regular public schools[2], and estimated that at least $268 billion is needed for major rehabilitation and new construction of public schools across the country. USEPA estimates that one-half of our nation's public schools have indoor air quality problems. This represents an enormous opportunity to renovate and design schools that provide a healthy educational environment for students and teachers, build social capital in surrounding communities, cost less to operate, and impact lightly on the ecological health of the environment. In spite of clear evidence that such design can result in better health, increased learning capacity, and cost savings, numerous obstacles to the implementation of these "high performance"[3] schools exist.

-Perhaps the biggest obstacle to school facilities being healthy and high performance is the lack of understanding among key decision-makers and financers of the benefits of environmentally healthy schools. Bringing together school facility managers, educators, school finance professionals, architects, and health professionals to create a strategy for implementing high performance schools is a necessary first step toward improving learning environments for all students and establishing schools as centers of community.

Schools are important focal points of neighborhoods and families, and the springboard for a civil society. As more children come from single parent and dual-income families, the school and its surroundings increasingly become a second home to children, especially in the elementary years. High performance schools provide a range of benefits including a healthy, non-toxic environment during the extended school day, enhanced learning ability and the opportunity for community leadership in health and environmental issues. Every day one in five Americans (approximately 55 million people) occupies a school building, and the majority of these occupants are children.[4] Children and teachers spend at least six hours per day in school buildings. In many communities the extended school day for children in before- and after-school care can result in children in school facilities for up to 12 hours. Healthy Schools Network's Claire Barnett suggests that "Children spend 90% of their time indoors and the great

indoors is always dirtier, more crowded, and more polluted than the great out of doors especially in densely occupied, poorly maintained schools."[5] Increasingly, it is important to provide a healthy environment for these students and their teachers. Studies have shown that enhanced indoor air quality, reduction of air-borne pollutants, increased ventilation, increased day lighting, and access to safe outdoor spaces enhances student ability to concentrate and study.[6] Asthma is the leading cause of school absenteeism due to chronic illness, accounting for over 10 million missed school days per year. Nearly one in 13 school age children has asthma, and the impact falls disproportionately on African American and certain Hispanic populations, particularly those living in urban areas[7] (often representing distressed - both from an achievement and facilities standpoint - school districts, where students can least afford to miss school). In 1997-1998, 8.3 percent of non-Hispanic Black children living in families below the poverty level had asthma, the highest for all racial groups and income levels.[8] Studies show that one-half our nation's 115,000 schools have problems linked to indoor air quality that may include common asthma triggers such as pests, mold and dander, as well as cleaning agents, chemicals, pesticides, and poorly ventilated workspaces.

The economic aspects of school management are a key consideration in high performance schools. School funding is at the heart of local, state and federal initiatives to make school facilities healthy and conducive to learning. As witnessed in the current California energy crisis, heating and cooling costs spare no facility or operation. The US Department of Energy (DoE) estimates that schools spend more than $6 billion annually on energy, and that they could save at least 25% of this amount through better design (even in renovated older buildings) through the use of energy-efficient and renewable energy technologies, and improvements in operations and maintenance. This will result in an overall savings of 1.5 billion dollars per year. DoE also estimates that school energy costs are approximately $110 per student per year, with costs of wastewater processing and trash removal adding to a total of $140 per student per year. High performance, sustainable design solutions can yield savings up to $56 per student per year.[9] As an example of the savings possible, it is estimated that improved energy efficiency in 91 public school buildings in Pittsburgh will save over $750,000 per year. Given the uncertainty of energy markets, schools could be community leaders in reducing energy demand and increasing savings. The savings could be used toward physical facility improvement, reduction in class size, increased teacher salaries, and enhanced instruction. All schools, including those in distressed districts, should have the opportunity to realize these savings.

Environmental stewardship is another area where schools can play an important role. In a 1994 Roper Starch Worldwide Poll investigating young people's attitudes toward the environment, commissioned the National Environmental Education and Training Foundation[10], it was found that students, both from disadvantaged and non-disadvantaged areas, feel that protection of human health is by far the most important reason for protection of the environment, but that it is also important to protect the environment for plants and animals. In order to bring students into understanding their own place in nature, schools need to emphasize methods of reducing the environmental impact of buildings on their surroundings. Reduction in energy use results in reduction in air pollution including particulates that cause lung disease and ozone pollution, as well as green house gas and acid deposition.[11] Water conservation and appropriate land use are important aspects of environmental stewardship as well. Reduction in the use of toxics for cleaning and pest control is another contribution that schools can make as environmental stewards.[12] If schools use their collective purchasing power toward pollution reduction in materials, energy, and maintenance, the overall cost savings could be great, as could the non-monetary value of modeling environmentally responsible practices for the community at large.

Increasingly, schools are seen as centers of life-long learning for the entire community, not just the kindergarten through high school years. A national movement integrating schools more closely with the community is growing. In a Department of Education April 2000 Publication "Schools as Centers of Community: A Citizens' Guide for Planning and Design", the following six principles assert that, in order to meet the nation's needs for the 21st century, we must design learning environments that enhance teaching and learning to accommodate the needs of all learners

- Serve as centers of the community
- Result from a planning/design process involving all stakeholders
- Provide for health, safety and security
- Make effective use of all available resources
- Allow for flexibility and adaptability to changing needs.

In order to have the above principles become useful to most communities, much work needs to occur across the broad scope of community stakeholders in changing the way schools are renovated and built

Another important characteristic of healthy, "high performance", energy-efficient schools, is the use of the school building and nearby physical environment as a pedagogical tool. Place-based learning and environmental teaching techniques are increasingly recognized as essential tools in increased retention of science, social science, mathematical and language arts skills[13]. Students investigating the "ecological footprint" or impact of the school building use science and math to conduct measurements and audits of energy, materials and resource consumption, and apply social studies and language arts to propose and communicate strategies for reducing the impact. Teachers, once trained in this method find that it opens the door for critical thinking, transfer of problem solving skills to other academic frameworks and cooperative learning. Studies have shown that scores on standardized tests are increased by using environment as an integrating concept. Additionally, research done indicates that 96% of teachers and principals surveyed thought that school design was an important part of a good learning environment. Furthermore, 92% said that they would be willing to devote nearly 4 hours per week to collaborating with facility designers, but that most had never been asked.[14]

The studies show that improved schools would improve our children's health and their ability to learn and achieve. The technology exists to build and renovate these building to higher standards. Using high performance building techniques saves money and is fiscally responsible as well as environmentally responsible by saving energy and water and preventing pollution. The wisdom exists to implement policies to support our children's health, and the greater community and environmental well-being. Governmental leaders can fully fund and support these measures that will yield results far beyond the federal investment. I appreciate this opportunity to speak with you today and hope that these federal governmental mandates will be funded in the near future.

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[1] There are numerous studies, among them the following available on-line at www.epa.gov/iaq/asthma/intor/index.html; www.epa.gov/iaq/schools/caseca.html; www.h-m-g.com; and www.innovativedesign.net

[2] Conditions of American Public Schools Facilities. 1999 US Department of Education http://nces.ed.gov/pubs2000/2000032.pdf

[3] "High performance" is also used as a term for describing student academic performance. We believe that just as students are held to high standards, school buildings should be designed for similarly high standards of performance, with buildings contributing to student opportunities and outcomes.

[4] USEPA Tools for Schools www.epa.gov/iaq

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[5] Press release January 15, 2002 in reference to The Healthy and High Performance Schools amendment to the newly signed federal education budget.

[6] http://www.epa.gov/iaq/schools/caseca.html; http://www.h-m-g.com; http://www.innovativedesign.net

[7] http://www.epa.gov/iaq/asthma/intro/index.html

[8] America's Children and the Environment: A first View of Available Measures, USEPA December 2000.

[9] US Department of Energy Rebuild America K-12 Program

[10] http://eelink.net/ROPER/html

[11] From 1993 to 1998, 146 schools in Canada decreased their greenhouse gas emissions by the equivalent of 10,000 tons of carbon dioxide.

[12] Montgomery County Public Schools in Maryland cut its pest control costs from $2,400 per school per year in 1985 to $575 per year in 1992 by using Integrated Pest Management and less toxic alternatives.

[13] Improving Student Learning: Using the Environment as an Integrating Context. 1997. Gerald A. Lieberman, Ph.D. State Education and Environment Roundtable

[14] B. Schapiro and Associates "Perceptions of Educators about School Design Issues," survey conducted for Heery International, Atlanta, GA. 1998. As seen in Harvard Education Letter. January/February 1999

Testimony Submitted to the
Environment and Public Works Committee
U.S. Senate

Regarding Green School Initiatives
by Daniel Swartz
Executive Director
Children's Environmental Health Network
October 1, 2002

The Children's Environmental Health Network commends this Committee for bringing attention to the issue of children's environmental health and the important relationship between children's health and the school environment.

We appreciate the opportunity to submit this testimony for the record. The Children's Environmental Health Network is a non-partisan and multi-disciplinary national project whose mission is to protect the fetus and the child from environmental hazards and to promote a healthy environment. The Network's Board of Directors and committee members include numerous experts in children's environmental health who serve on key Federal advisory panels and scientific boards.

The last few years have seen a dramatic increase in awareness of the simple fact that children may be harmed by a wide range of environmental toxicants – often in ways quite dissimilar to adults. Yet much more needs to be done in educating the public, changing behavior, amending our policies, and gaining more information if we are to meet the challenge of providing a healthy environment and protecting our children from environmental risk.

In my testimony, I'd like to highlight a few of the basic medical and scientific concepts that form the foundation for this field and outline how our policies relating to school facilities can better recognize these concepts.

A fundamental maxim of pediatric medicine is that children are not "little adults." What does this mean when we talk about children and environmental toxicants? Scientists have documented the many differences between adult and child behavior and exposures; often these differences lead to higher exposures for children. The medical evidence is unassailable that every child experiences particular windows of vulnerability from conception through adolescence. In brief, children can be more susceptible to harm caused by environmental agents. Exposures that for an adult may have little or no consequence can result in life-long harm for a child.

There is clear, sound science underlying these principles. There is a solid consensus in the scientific community for these concepts. As additional scientific knowledge in this field expands, it continues to reinforce this foundation. I am attaching materials on these points developed by the Network for additional background (Attachment 1).

If we take these principles and apply them to the school environment, these are the types of pediatric, scientific and public health concepts that should be shaping the policies and activities of our educational institutions:

- Children deserve a safe and healthy school environment, including protection from harmful environmental exposures.
- Every child experiences particular windows of vulnerability from conception through adolescence. Exposure at those moments of vulnerability to environmental hazards can lead to permanent and irreversible damage.
- These windows of vulnerability do not exist for adults, so standards based on effects on mature systems will not take into account children's vulnerabilities.
- Children's exposures to environmental toxicants are not the same as adult exposures; exposure estimates based on adult exposures are likely to understate children's exposures.
- Past practices which do not take children's vulnerabilities and exposures into account cannot be assumed to be protective of children's health.
- Parents and other caregivers deserve to know what their children are exposed to in school facilities and the impact of such exposures.
- Research, data collection and other components of public health infrastructure must be in place to identify and correct existing problems and to prevent potential environmental problems in school facilities and children and their caregivers should have access to these resources.

However, in most cases our educational facilities are not guided by these concepts. Children spend hours every day in and around their school. Chemical toxicants and biological agents in the classroom, on the playground, in the science lab, or in other school facilities can lead to health risks and adverse learning conditions. They can affect many different body systems and impact health, learning, productivity, and self esteem. Yet few steps have been taken to protect children from environmental toxicants in the school environment. I am also attaching to this testimony a summary of the health effects and toxicants of greatest concern in the school environment. (Attachment 2)

Leadership through Policy

We join with other witnesses testifying today commending the Senate for its leadership in passing such important initiatives as the Healthy and High Performance Schools provisions in H.R. 1/P.L. 107-110, the "No Child Left Behind Act of 2001" and the "School Environment Protection Act."

Under the Healthy and High Performance Schools program:

- The Department of Education is directed to undertake a study of "unhealthy public school buildings" and their health and learning impacts.
- A joint Department of Education-Department of Energy-Environmental Protection Agency grant program was created to award grants to State and local educational agencies to support healthy and high performance school buildings.
- The Department of Education is to biennially report to Congress on this program.

The Network was delighted at the enactment of these provisions. We strongly urge their full implementation, and expect these measures to receive the strong support of both Congress and the Administration. The Department of Education must provide funding and implementation of these provisions. The Department must also be a full participant in activities such as the Interagency Task Force on Children's Environmental Health and Safety and the National Children's Study.

Though the Network and others were heartened by the Senate's decision to -- twice -- adopt the "School Environment Protection Act," we were doubly disappointed by the House's decisions not to accept these important provisions on the education bill and the farm bill.

Many school districts around the nation have implemented integrated pest management (IPM) programs to minimize the use of pesticides and have instituted processes to provide advance notice of pesticide use in schools to parents and employees. The "School Environment Protection Act" would further encourage schools to adopt IPM programs and would provide a valuable tool for parents.

Additional Steps

These efforts are vital, but additional efforts are needed, such as research into the relationship between environmental hazards at school and their affect on health and learning. This type of research must also involve interagency coordination and support.

Little is known about the incidence of health effects which may have a school-related environmental component, the substances to which children are exposed in school, and connections between these exposures and health effects. Little is known about exposures in the school environment, where millions of American children spend a large portion of their childhood. No research or data collection efforts exist. Schoolchildren and their families deserve access to an agency which can help answer their questions, investigate concerns and provide information on exposures.

A network for identifying, investigating, responding to, and preventing environmental health problems in schools is needed to help protect children's health in school. Data systems that link environmental factors with health conditions need to be developed to obtain data for disease prevention and health promotion. Such a network would help to close the gap in knowledge regarding the prevalence and incidence of environmentally-related conditions and environmental exposures. The Network urges the Committee to support S. 2054, the "Nationwide Health Tracking Act of 2002."

Schoolchildren deserve to be protected from environmental hazards in their school; however, no standards exist providing such protections.

For example, in the states with Occupational Safety and Health Administration (OSHA) coverage, school employees are covered by standards including:

- a written hazard communication standard that lists all products with toxic ingredients, access to material safety data sheets, training for employees on chemical hazards;
- protective equipment for employees to use;
- a laboratory standard covering science teachers and technicians;
- emergency evacuation procedures; and
- access to any environmental monitoring performed by the employer.

However, students are not covered by these standards.

Also, as a result of queries from school personnel, the National Institute for Occupational Safety and Health (NIOSH), has visited schools for Health Hazard Evaluation (HHE) investigations, which assess

risks and exposure and health consequences for employees when there are no standards. These investigations can be requested by employers and employees.

Just as is the case with OSHA, schoolchildren are not under the jurisdiction of NIOSH, so the institute does not have the authority to undertake investigations based on concerns about student risks, exposures and health effects. The Network believes school children deserve at the very least the level of protection and research afforded working adults -- and probably even more protection.

We commend you for the leadership you have shown by holding this hearing. Again, thank you for the opportunity to testify.

ATTACHMENT 1

Protecting Children from Environmental Toxicants

CHILDREN'S ENVIRONMENTAL HEALTH NETWORK

Every day, we are exposed to dozens, perhaps hundreds, of chemicals. Such extensive exposure is relatively new. Since World War II, thousands of new, primarily synthetic, chemicals have been discovered and introduced into commerce and our environment. In 1940, the annual production of synthetic chemicals was 1.3 billion pounds; in 1980, it was 320 billion pounds.[i] In 1999, more than 7 billion pounds of toxic chemicals were released into the nation's environment.[ii] Chemicals are ubiquitous; traces of synthetic compounds are found in all humans and animals around the world.[iii]

Both synthetic and natural chemicals, such as lead, once released into the environment, can harm the health of humans and wildlife.

The diverse and growing range of chemicals to which we are exposed means that today's children live in an environment vastly different from previous generations. Currently more than 70,000 chemicals are in use. For the majority of these chemicals, little is known about their health effects on children.[iv]

Children Are Not Just "Little Adults"

Children, from conception through adolescence, are in a dynamic state of growth as their immature nervous, respiratory, reproductive, immune and other systems develop. Because of these developing systems, growing organisms can be more vulnerable to permanent and irreversible damage from toxicants than mature organisms.

Children experience the world differently than adults, meaning that children's exposures to environmental toxicants and their levels of exposure can vary dramatically from those of adults.

The Delicate Choreography of Children's Growth

The primary task of infancy and childhood is growth and development. If growth and development are hampered, the chances of a healthy adulthood are dramatically decreased. Many different kinds of environmental insults have the potential to damage these natural processes, potentially leading to lifetime harm. It is often impossible to repair damages that occur in childhood.

Studies of the impact of exposure to environmental toxicants on development make clear that not just the degree and route of exposure but also the timing of the exposure affects the response.

Example: Development of the Nervous System. One of the critical organ systems to be considered in evaluating the effect of environmental toxicants on the fetus, infant, and child is the nervous system. Its anatomic and functional development is complex, intricate, and dependent on a precise sequence of events that occur at specific points in the development of the child. This exquisitely scripted pattern of development can be disrupted and irreparably injured by various agents at various stages, resulting in very specific alterations of neurologic and behavioral development. Key stages in the anatomical development of the central nervous system, beginning in utero and continuing into adult life, include:

j **Formation of the neural tube**, an embryonic structure that leads to all further brain development.
j **Neuron proliferation,** the growth of functional brain cells.
j **Cell migration,** the process by which cells move from one place to another to form the complex structure of the brain.
j **Synaptogenesis,** the process by which connections between neurons occur. Both the numbers and complexity of these interconnections affect the functioning of the brain.
j **Cell death**. The nervous system initially produces more neurons than it needs. The process of brain maturation requires the retention of some neurons and the natural loss of other neurons.
j **Pruning of synapses.** Synaptogenesis, which peaks at two years of age, creates more connections between neurons than are needed. Subsequently, there is an orderly process of loss of some connections and retention of others.
j **Myelination**, the process by which the communicating structures of neurons are covered to protect them and improve their function. Myelin functions like the insulation on an electrical cord.

Each one of these vital steps to a healthy brain and nervous system can be disrupted by environmental agents, resulting in permanent injury or impairment.

Because of children's developing systems, children can be more susceptible to harm caused by environmental agents. Exposures that for an adult may have little or no consequence can result in life-long harm for a child.

Children are different from adults in other ways. Because biochemical systems are still developing in the fetus and the child, their ability to detoxify and excrete toxins differ from adults. This difference is sometimes to their advantage, but more frequently children are not as able to excrete toxins and thus are more vulnerable to them.[v]

What we don't know about the effects and potential effects of environmental toxicants is far more than what we do know, not just for the nervous system (see box) but also for our reproductive, immune and other critical systems, as well as our state of knowledge for carcinogenic, endocrine and other health effects.

Children Experience The World Differently

Children's exposures to environmental toxicants, and their levels of exposure, can vary dramatically from those of adults.

Pound for pound, children eat more food, drink more water, and breathe more air than adults do. Young children have higher metabolic rates than do adults.[vi] A school-age child, on average, drinks twice as much water per pound of body weight and eats two to three times as much fruit per pound of body weight as an adult.[vii] Because of these differences, potential exposure to toxins that might be in the water or the air such as lead, pesticides, and nitrates is potentially greater for children.

Exposure differences are also a result of locations where children spend time, the activities in which children indulge, and children's level of personal hygiene. Thus, in identifying how children may be exposed to a chemical and the level of exposure, it is inadequate to simply extrapolate from adult exposure.

Behavioral differences, because of age and developmental stages, means that opportunities for exposure to environmental chemicals such as pesticides also differ. These differences exist both between adults and children as well as between children of different ages.

Some examples of children's behavior and activities that lead to exposure differences include:

jYoung children spend hours close to the ground where there may be more exposure to toxins in dust, soil, and carpets as well as to low lying vapors such as radon or pesticides.
j Toddlers and primary school children may spend many hours sitting or lying on the floor while watching TV or playing games (2-3 hours/day). They place their fingers in their mouth frequently (9-10 times/hour); they are constantly touching their clothes (65 times/hour), objects (118 times/hour) and surfaces (97 times/hour). When they put their fingers in their mouth, whatever they have touched, they swallow.
j Children often eat snacks while sitting on the floor, thus whatever environmental chemicals are on the floor can adhere to both their hands and food and will be ingested through hand to mouth activities and through contamination of the food with dirty hands.
j Primary school children are likely to spend more time outdoors than toddlers or infants, typically in contact with dirt or grass and are also more likely to be outside barefoot than either older or younger children. They roll on the grass, tumble, and play games. They typically do not wash their hands after coming indoors and before eating. Whatever is on the grass may be absorbed through the skin on the body and feet or ingested when they put their hands in their mouth.
j Older children also spend a lot of time outdoors, typically playing organized games such as soccer or football, or hanging out. Their activities may include dermal contact with soil or grass.[viii]

This type of behavior/exposure data do not exist for children older than 12. In addition to sources of exposure through play that may be similar to younger children, older children may have exposures similar to adults. For example, adolescents may work on farms or can be exposed to workplace toxins in shop class, vocational-education settings, and in work settings.

The data that do exist show that children are more heavily exposed than adults to toxicants such as pesticides. For example, studies that looked at biomarker levels for a commonly used organophosphate pesticide, chlorpyrifos, in children and adults found that the levels of the pesticide in children were substantially higher than in the adult population.

Summary

In brief, a child's metabolism, physiology, diet, exposure patterns, and behavior are different than those of an adult.

A child is exposed to multiple toxicants in the course of her/his life, sometimes simultaneously, sometimes sequentially. Children have a longer life span than adults so they have more time to develop diseases with long latency periods that may be triggered by earlier environmental exposures, such as cancer or Parkinson's disease.[ix] The effects of multiple and/or cumulative exposures and their potential synergistic effects are not known.

Experience with a variety of chemicals, from alcohol to environmental toxicants like lead and mercury, has shown us that what is safe for the adult is not necessarily safe for the fetus, infant or child. Exposure levels that for an adult would have no impact or a transitory impact can have life-long negative consequences for a child.

For More Information:

Contact the Children's Environmental Health Network at 202-543-4033 or visit the Network's Web site <www.cehn.org> which includes the *Resource Guide on Pediatric Environmental Health*.

About the Network

The Network is a non-partisan and multi-disciplinary national project whose mission is to protect the fetus and the child from environmental hazards and to promote a healthy environment. The Network's three areas of concentration are education, research and policy.

ATTACHMENT 2

Environmental Health In Schools

CHILDREN'S ENVIRONMENTAL HEALTH NETWORK

Chemical toxicants and biological agents in the classroom, on the playground, in the science lab, or in other school facilities can lead to health risks and adverse learning conditions. They can affect many different body systems and impact health, learning, productivity, and self esteem.[x]

Children spend hours every day in and around their school facilities. However, few steps have been taken to protect children from environmental toxicants in the school environment.

Other than lead[xi], asbestos,[xii] and radon,[xiii] the Federal government has not instituted requirements or guidelines that would protect children from the same chemical exposures that require employee notification and other worker protections. Although students may indirectly benefit from the Occupational Safety and Health Administration (OSHA) and National Institute for Occupational Safety and Health (NIOSH) activities that cover school employees, OSHA and NIOSH have no jurisdiction for investigating the health impact of exposure to students. Additionally, only 26 states have OSHA coverage for their public employees.[xiv]

Specific health effects and toxicants of concern in the school environment include:

AIR POLLUTANTS, AIR QUALITY, and ASTHMA

Children are especially susceptible to air pollutants. The airways of young children are smaller than those of adults. Inhalation of air pollutants that would produce only a slight response in an adult can result in a significant obstruction in the airways of a young child. Children have increased oxygen needs compared to adults, they breathe more rapidly and, therefore, inhale more pollutants per pound of body weight than adults. They often spend more time engaged in vigorous outdoor activities than adults.

- Asthma is the leading serious chronic illness among children.[xv] The number of children with asthma in the United States is rapidly growing, increasing by 75 percent between 1980 and 1994.[xvi] Asthma is the number one cause of hospitalization among children under the age of 15.[xvii]

- Asthma is the leading cause of school absenteeism due to a chronic illness.[xviii] The U.S. Environmental Protection Agency estimated that American children lost 17 million school days in 1997 due to the disease, and that parents lost 5 million work days in order to care for their children with asthma-related illness.[xix] Nearly 1 in 13 school-age children has asthma.[xx]

- The impact of asthma falls disproportionately on African-American and certain Hispanic populations and appears to be particularly severe in urban inner cities.[xxi] These differences include both the incidence of asthma as well as mortality rates. In 1997, non-Hispanic Black children living in families with incomes below the poverty level were found to have the highest rates of asthma.[xxii] Between 1980 and 1993, death rates for asthma were consistently highest among blacks aged 15-24 years.[xxiii]

- Major indoor triggers of asthma attacks include irritants such as commercial products (paints, cleaning agents, pesticides, perfumes), building components (sealants, plastics, adhesives, insulation materials), animal and insect allergens, environmental tobacco smoke, and molds.[xxiv] Many of these triggers can be found in schools.[xxv]

- Air pollutants such as particulate matter[xxvi] and ozone[xxvii] also can trigger asthma attacks.

- Although the causes of asthma are not yet known, one recent 10-year study found that ozone was linked to causing asthma, especially among physically active school age children living in high ozone communities.[xxviii]

- Nitrogen dioxide and sulfur dioxide decrease lung function in asthmatics.[xxix] Long-term exposure to air pollution (such as nitrogen dioxide and particulate matter) slows children's lung development over time. While these are generally thought of as outdoor air pollutants, these agents will be found in schools that keep windows open much of the year. In addition, children will encounter these pollutants during school hours while on the playground or sports field during recess, physical education and sporting events.

- Poor indoor air quality can reduce a person's ability to perform specific mental tasks requiring concentration, calculation, or memory.[xxx]

- Air quality problems inside school buildings can arise from a variety of sources, such as mold growth from excessive moisture, chemical emissions, insufficient fresh air supply, pollutants, and high radon levels.[xxxi]

- 27% of schools in a U.S. General Accounting Office survey reported unsatisfactory ventilation. 22% reported unsatisfactory indoor air quality generally.[xxxii]

- An EPA investigation of 29 schools across the country found inadequate ventilation in most of the schools.[xxxiii]

LEARNING DISABILITIES -- DEVELOPMENTAL DISABILITIES

Seventeen percent of children under 18 have been diagnosed with one or more developmental disabilities. These disabilities include Attention Deficit-Hyperactivity Disorder (ADHD) and autism and are the result of complex interactions among genetic, environmental and societal factors that impact

children during vulnerable periods of development.[xxxiv]

- A recent Centers for Disease Control and Prevention (CDC) report indicated that approximately 1.6 million elementary school-aged children (7 percent of children 6-11 years of age) have been diagnosed with ADHD, which is also known as Attention Deficit Disorder (ADD).[xxxv]

- A recent National Institute of Environmental Health Sciences (NIEHS) study indicated that the incidence of ADHD may be greatly underestimated by school and public health officials. In the study, parents reported more than 15 percent of boys in grades one through five had been diagnosed with ADHD. Overall, more than nine percent of all fourth and fifth grade children studied were taking medication to treat ADHD.[xxxvi]

- Known or suspected causes of brain and nervous system disorders are exposure to lead, methylmercury, and some pesticides, therapeutic drugs and food additives.[xxxvii] Other chemical classes suspected of developmental neurotoxicity include cancer chemotherapy medications, polyhalogenated hydrocarbons, psychoactive drugs, and solvents.

MERCURY

Schools are places where children and elemental mercury may come together via thermometers and barometers, in laboratory courses or "show-and-tell." Mercury can also be released through broken fluorescent light tubes or thermostats. Elemental mercury is a liquid at room temperature but readily volatizes to a colorless and odorless vapor.

- Mercury is a potent neurotoxicant and children are particularly susceptible to mercury's dangers. Mercury interferes with brain development and more easily passes into the brains of fetuses and young children than into the brains of adults.

- Both short- and long-term exposure to mercury vapor can lead to brain disorders. These include a wide variety of cognitive, personality, sensory and motor disturbances.[xxxviii]

- Mercury poisoning is linked to kidney and liver damage and reproductive disorders.

- Exposure to high levels of mercury vapor, such as heating elemental mercury in inadequately ventilated areas, have resulted in fatalities.[xxxix]

- Mercury-containing products or spills must be properly handled. Even small mercury spills require specialists. Improper clean-up of a mercury release, such as vacuuming up the mercury from a broken thermometer, will spread the mercury into the air.[xl]

- In July 2000, the National Academy of Sciences concluded that every effort should be made to reduce the release of mercury into the environment.

PESTICIDES

- Pesticide exposure may result in symptoms ranging from relatively mild headaches and skin rashes to paralysis and death. Some long-term illnesses linked to pesticide exposure may be subtle -- such as neurological disorders or reduced cognitive skills.[xli] Long-term illnesses and those with delayed onsets, such as cancer, which may appear years after exposure, can also occur. Most exposures to pesticides cause no symptoms. Even when exposures are symptomatic, they are often misdiagnosed. This may mask the true extent of the illnesses caused by pesticides.[xlii]

- Scientific reviews of the U.S. pesticide regulatory system identified important gaps in knowledge about the health effects of pesticides on children's developing systems as well as children's actual exposures to pesticides.[xliii] According to the American Academy of Pediatrics, "because the health effects of pesticide exposure on children are not well studied, an approach that reduces their exposure to these chemicals is desirable." [xliv]

- Pesticide use in schools can be widespread. It can include "routine spraying," ostensibly to prevent the development of problems, in classrooms, hallways, the cafeteria, and other areas. This type of use may result in children being exposed to high levels of pesticides.[xlv] Additionally, pesticides can be used in the building when an infestation is noted and pesticides may also be used outside on lawns and playing fields.

- Information about on the amount of pesticides used in the nation's 110,000 public schools is not available. The Federal government does not collect such data, and, as of 1999, only two states collected data on pesticide use in a manner that allows for identifying use in school facilities.[xlvi]

- From 1993 through 1996, about 2,300 pesticide-related exposures involving individuals at schools were reported, according to the American Association of Poison Control Centers (although these data are not believed to be complete).[xlvii]

LEAD

- Lead is a potent neurotoxin. Exposure to lead can cause a variety of health effects, including delays in normal physical and mental development in children, slight deficits in attention span, hearing, and learning disabilities of children. Long-term effects can include stroke, kidney disease, and cancer. [xlviii]

- Children of day-care-age who are in lead-contaminated buildings will be at highest risk of adverse outcomes from the exposure, but older children may be effected as well.

- A common source of lead exposure for children today is lead paint and the contaminated dust and soil it generates.[xlix] According to a report on the condition of the nation's school facilities by the U. S. General Accounting Office, schools built before 1980 were painted with lead paint.[l]

- Children may also be exposed to lead through drinking water that has elevated concentrations from lead plumbing materials. Lead contamination in drinking water occurs from corrosion of lead pipes

and it cannot be directly detected or removed by the water system.[li] According to the EPA, the longer water remains in contact with leaded-plumbing, the more the opportunity exists for lead to leach into water. As a result, facilities with on again/off again water use patterns, such as schools, may have elevated lead concentrations.[lii]

- Some support was provided to schools through the Lead Contamination Control Act of 1988 to identify and correct lead-in-drinking-water problems at schools, especially water coolers with lead-lined tanks.[liii]

SCHOOL BUSES and DIESEL EXHAUST

- According to the EPA, diesel engine emissions contribute to serious public health problems including: premature mortality, aggravation of existing asthma, acute respiratory symptoms, chronic bronchitis, and decreased lung function. They have also been linked to increased incidences of various cancers in adults in more than 30 health studies.

- Diesel exhaust is known to be a major source of fine particles that can lodge deep in children's lungs, increasing the likelihood of asthma, chronic bronchitis, heart disease and even premature death.[liv]

- In the United States, nearly 600,000 school buses transport 24 million students to school daily. Collectively, U.S. children spend 3 billion hours on school buses each year.[lv]

- Children who ride diesel school buses are exposed to an excessive amount of toxic diesel exhaust. The excess levels on the buses are 23 to 46 times higher than levels considered to be significant cancer risks according to the U.S. Environmental Protection Agency and federal guidelines. The diesel exhaust exposures are likely to result in an additional 23 to 46 cancer cases per million children exposed.[lvi]

MOLD

- Mold grows on virtually any substance when moisture and oxygen are present, including ceiling tiles, carpets, wood and paper. Some molds, such as black molds or Stachybotrys, are known to produce potent toxins which can cause impaired breathing and cause allergies.[lvii]

- Children can be exposed to mold in schools if the building has indoor air that is very damp or if there have been water leaks. Mold may grow within 48 hours if the building materials or furnishings are damp.[lviii]

- The common symptoms of mold toxin exposure include headache, fatigue, diarrhea, nausea and respiratory irritation.[lix]

FOR MORE INFORMATION:

Contact the Children's Environmental Health Network (www.cehn.org) at 202-543-4033 or the Healthy Schools Network (www.healthyschools.org) at 518-462-0632.

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OCT. 1, 2002 HEARING TESTIMONY FOR THE RECORD

U. S. Senate Committee on Environment & Public Works
410 Dirksen Senate Office Bldg., Washington, D.C. 20510-6175
Phone: 202-224-8832, Fax: 202-224-1273
E-mail: carolyn_dupree@epw.senate.gov

Dear Committee Members: 09-27-02

We need both, effective national indoor air quality standards and an illness tracking system for schools. The lack of sufficient funding for school operation and maintenance is like painting a room with a paintball gun and is not conducive to a good learning.

My asthmatic son Glenn, is highly allergic to mold, mildew, and fungi. He missed 32 days of school last year in the first two months of third grade. For him 40% humidity is too low and 50% humidity is too high. I monitor & record his peak flow breathing levels 3x a day to document irreplaceable loss of class experience and productivity, which is detrimental to his educational attainment. He is a part of a minority group that are the labor force replacements that must be able to support this country's ever increasing elderly population's retirement and healthcare benefits.

His school is down gradient of high-density development built when drain it & get it out of there fast was the acceptable method of stormwater management Three maintenance guys are responsible for 211,000 sq. ft. plus 80 acres of school property. Their duties include setups for programs, meetings and events; heating, snow removal & salting; repairs and preventative maintenance. Each custodian has to clean 29,000-sq. ft. per day, which equates to just over 60 sq. ft. per minute in a normal day. The per student debt last year was $7239.00 not including the local high school. Glenn's school used emergency funding for repairs because a recent referendum failed by 85%. The voting majority's average income is about $29,000 which is not a living wage.

Wisconsin capped school operation costs, froze school construction costs, and will not recognize the extra 30 million dollars it estimates schools could need this year. It does not allow developers to be charged impact fees for facilities owned by school districts; and has a law which basically says "you can not build anything worse than dirt." In this state, built to code is nothing to brag about.

Children are the most valuable resource in the United States, which clearly needs to have healthier schools in this global economy where only the smartest nation will survive.

Most Sincerely and Respectfully,

Christine Gustafson

Christine Gustafson
24001-119th St.
Trevor, WI 53179
Home phone: (262) 862-2874

CENTER FOR CHILDREN'S HEALTH AND THE ENVIRONMENT

MOUNT SINAI SCHOOL OF MEDICINE

MOUNT SINAI SCHOOL OF MEDICINE

Testimony of

Philip J. Landrigan, M.D., M.Sc.

Ethel H. Wise Professor and Chair
Department of Community and Preventive Medicine
Professor of Pediatrics
Director, Center for Children's Health and the Environment
Mount Sinai School of Medicine
New York, NY 10029

Environmental Threats to Children's Health in America's Schools:
The Case for Prevention

Before the
Committee on Environment and Public Works
United States Senate
Washington, D.C.
Tuesday, October 1, 2002

Mr. Chairman and Members of the Committee:

My name is Philip J. Landrigan, MD. I am a pediatrician, Chairman of the Department of Community and Preventive Medicine and Director of the Center for Children's Health and the Environment of the Mount Sinai School of Medicine in New York City. A copy of my curriculum vitae is attached to my testimony.

I will focus my testimony on environmental threats to children's health in America's schools.

Introduction

School is a place where children spend 5 to 8 hours per day, 5 days each week for 12 or more years of their lives. For our nation's future, it is essential that schools provide our children a sound education and prepare them for future citizenship. It is also essential that our nation's schools provide a safe haven for our children and contain an environment that is free from threats to children's health.

Unfortunately, schools are not always free from environmental hazards. Pesticides, lead, and asbestos are three classes of hazardous chemical that have been found in America's schools. These are chemicals that can cause disease, acute as well as chronic. They can interfere with children's learning.

Fortunately, there exist well-studied, and proven techniques for dealing with these environmental hazards in schools and for minimizing the threats they pose to our children's health. I shall review this information in my testimony.

Children's Vulnerability to Environmental Toxins

Children are especially sensitive to environmental toxins. Pound for pound of body weight, children have greater exposure to pesticides because they drink more water, eat more food and breathe more air than adults. Two additional characteristics of children further magnify their exposures: 1) they live and play close to the floor; and 2) they constantly put their fingers into their mouths. Children's metabolic pathways, especially in the first months after birth are immature. Generally they are less well able to metabolize, detoxify, and excrete toxicants than adults and thus are more vulnerable to them. Children are undergoing rapid growth and development, and their developmental processes are easily disrupted. Since children have more future years of life than most adults, they have more time to develop chronic diseases that may be triggered by early exposures

- **Pesticides**

  The Problem. Schools, with their cafeterias and lunches stored in lockers, provide an ideal indoor habitat for pests. According to cooperative extension services, common insects that inhabit school buildings include cockroaches, bees, wasps, ants, flies as well as rodents and birds.

  Pesticides are widely used in schools to combat these pests. Pesticides are a diverse group of chemical compounds and they are among the classes of toxic chemicals most commonly encountered by children. Pesticides include insecticides, fungicides, herbicides, and rodenticides.

  Pesticides have been shown to cause injury to human health, as well as damage the environment. The health effects include acute and persistent injury to the nervous system, lung damage, injury to the reproductive organs, dysfunction of the immune and endocrine systems, birth defects, and cancer. The principal classes of insecticides in use in the US are the organophosphates, carbamates, and pyrethroids. The organophosphates and carbamates are toxic to the nervous system and some of the pyrethroids are believed to be toxic to the reproductive system and disruptive to endocrine function.

  A recent survey by Connecticut environmental researchers showed that schools in 13 of the 16 school districts in Connecticut were treated with pesticides on a monthly basis, even though they may not have needed it. Surveys in other states have similarly shown that 85 to 90 percent of school districts routinely apply pesticides, whether or not there is evidence of need. Pesticides used indoors included bendiocarb, chlorpyrifos, cyfluthrin, cypermethrin, pyrethrin, piperonyl butoxide, tralomethrin, and bromadiolone. In addition, seven school districts in Connecticut reported that townships were responsible for maintaining the athletic fields used by the schools; of these, 53 percent used herbicides, some of them known carcinogens.

  The effects of pesticide poisoning on children can be acute and obvious, or chronic, cumulative, and subtle. The Consumer Product Safety Commission collects data on acute pesticide poisonings in the US, based on statistical sample of emergency rooms in 6,000 selected hospitals. From 1990 to 1992, an estimated 20,000 emergency room visits were the result of pesticide exposure. The incidence was disproportionately high among children, who accounted for 61% or more than 12,000 of these cases. Organophosphates were the class of compounds most frequently involved.

  Acute high-dose exposure to organophosphate pesticides inhibits the enzyme acetylcholinesterase in the nervous system, leading to a spectrum of cholinergic symptoms, including lacrimation, abdominal cramps, vomiting, diarrhea, miosis, and profuse sweating. The more severe cases progress to respiratory arrest and death. Studies in animals indicate that the young are more susceptible than adults to this acute neurotoxic syndrome, probably because the young are less able to detoxify and excrete organophosphates.

Concern about the chronic effects of pesticides focuses on two particular areas: subclinical neurotoxicity and disruption of endocrine function. The notion of the possible "subclinical toxicity" of pesticides has gained increasing attention in recent years. This term denotes the idea that relatively low-dose exposure to certain chemicals, pesticides among them, may harm various organ systems without producing acute symptoms or being evident in a standard clinical examination. The concept arose from studies of children exposed to relatively low levels of lead who were found to have suffered loss of intelligence and altered behavior even in the absence of clinically detectable symptoms. The underlying premise is that there exists a continuum of toxicity in which clinically apparent effects have asymptomatic, subclinical counterparts. It is important to note that these subclinical changes represent truly harmful outcomes and are not merely homeostatic or physiological "adjustments" to the presence of pesticides.

Recent findings on the developmental toxicity of chlorpyrifos in animals illustrate the potential of pesticides to produce subclinical neurotoxicity in infants and children. The mechanism of chlorpyrifos-induced neurotoxicity appears to involve injury to the adenylyl cyclase cascade, a system in brain cells that mediates cholinergic as well as adrenergic signals. Even at low doses of exposure, insufficient to compromise survival or growth, chlorpyrifos was found to "produce cellular deficits in the developing brain that could contribute to behavioral abnormalities.

Because these animal data are so recent, studies of the developmental toxicity of chlorpyrifos in human infants have not yet been conducted. However, the animal data raise the concern that chlorpyrifos may not be the only organophosphate pesticide that could be a developmental toxicant in humans. The potential for such toxicity may be substantial in urban communities, where chlropyrifos is heavily applied in closed apartments.

On the basis of these findings, the EPA recently issued a ruling that bans the sue of chlorpyrifos in schools, parks, and day-care settings and that prohibits and phases out nearly all residential use. Preventing developmental disability in children was the major reason for this ruling. But many other similar organophosphate remain on the market and are used in schools.

The potential of pesticides to disrupt endocrine function has been recognized for nearly four decades, ever since the 1962 publication of Rachel Carson's *Silent Spring*. Carson's work showed that eagles and ospreys who had been heavily exposed to DDT had suffered disrupted estrogen cycles. As a result, these two predatory species at the top of the food chain were producing thin-shelled, nonviable eggs. Carson's work, along with the desire to prevent the bald eagle from becoming extinct, prompted the EPA to ban DDT in the early 1970s.

Recent concern about the endocrine toxicity of pesticides in humans has focused especially on the pyrethroids, a class of insecticides widely used as substitutes for chlorpyrifos and other organophosphate and carbamate pesticides. Pyrethroids have been used in pediatric practice to control body lice and scabies instead of more toxic agents such as lindane, and their acute toxicity is generally low. However, hormonal activity has been reported for certain pyrethroids in laboratory systems, suggesting that their capacity to affect hormonal and reproductive development in children should be investigated further.

The Solution. The control of pests in schools does not require heavy, preventive sprayings of toxic pesticides that can be harmful to children. The approach to pest management that is preferred by public health professionals is Integrated Pest Management (IPM). This concept calls for an approach that relies on a thorough knowledge of each pest and use of least-toxic, common-sense methods of keeping pests under control. The best, least-toxic way to control pests is to prevent them

from ever infesting an area in the first place-make sure they cannot get in, deny them access to food and water, and make the building uninhabitable. The IPM approach to cockroach control begins with eliminating the things that are attractive to them: take away their water sources by repairing leaky pipes and faucets, and treat areas that have condensation on them; wipe out their travel plans by repairing cracks and crevices with caulk; and take away their food sources by cleaning countertops and cooking surfaces. In IPM, chemical pesticides are used only as the strategy of last resort. I highly recommend that school districts contact their local cooperative extension program to see if they have IPM advice for pests in the district's region.

A legislative approach that has proven successful in several states in reducing children's pesticides exposures in schools is a legally mandated requirement that school districts provide parents advance notification of any planned application of pesticides. This approach has been adopted into law in Connecticut. Another sensible approach would be to develop a list of the most toxic pesticides and ban them from school premises.

- **Lead Paint**

The Problem. Lead is a toxic metal that can damage the kidneys, heart, and gastrointestinal system and can lead to brain damage in children. Granted, severe cases of lead poisoning have become less common in this country as medical treatment and efforts at prevention have become more sophisticated. However, we still need to be concerned because even low levels of lead can damage the developing brain and nervous system of a child. Studies have shown that children with even small amounts of lead in their blood have more difficulty learning and have lower intelligence quotients (IQ) than children without lead in their blood. In addition to affecting intelligence, lead poisoning may also cause behavioral problems, including a shortened attention span. The effects of lead poisoning (which are permanent) can occur silently and may often cause no symptoms.

The Solution. If lead paint is present, schools should call their local or state health department to find out what steps need to be taken to insure that children are not at risk for lead poisoning. Even if lead paint is not chipping or peeling, it can still pose a risk to children.

- **Lead in Drinking Water**

The Problem. In many older schools, drinking water is contaminated by lead because these schools have lead pipes in their plumbing. Some schools also have lead solder in their plumbing (lead solder was banned from use by the federal government in 1986). When water sits in contact with lead pipes or lead solder overnight, over a weekend, or during school vacations, it is possible for lead from the plumbing system to leach into the drinking water. Lead has also been found in some types of water fountains. Since childhood lead poisoning results from a child's cumulative exposure to lead from many sources in the environment, it is important to eliminate lead from every possible source in the environment, including water.

The Solution. The EPA has published guidelines to prevent lead poisoning. Under these guidelines, schools are required to test their water in a prescribed fashion and in accordance with EPA guidelines. If lead is detected in the water, the source must be identified and removed.

- **Asbestos in Schools**

The Problem. Asbestos is a mineral that has been used in schools for heat insulation and for acoustic purposes. Since the 1920s, billions of tons of asbestos have been used in homes, schools, and public buildings in the United States. The heaviest use of asbestos occurred in buildings built in the 1950s

and 1960s. In the 1970s, the use of asbestos rapidly declined as the health hazards of asbestos became better known. Such hazards include lung cancer and malignant mesothelioma (a cancer of the chest and abdomen lining). These cancers occur years after inhaling asbestos fibers. Lung cancer can occur 10 to 30 years after exposure to asbestos fibers, while mesothelioma generally occur 20 to 50 years after exposure.

The Solution. If asbestos is in poor condition, with apparent flaking and friability, it needs to be removed by a licensed, certified asbestos removal expert. If the asbestos is in good condition, with no flaking or cracking, it is better to leave it alone, and a commonly used approach is to put physical barriers between it and children, while continuing to monitor its condition on a regular basis. Under the EPA's Asbestos Hazard Emergency Response Act (AHERA), schools are inspected and asbestos removed, according to carefully developed regulations.

Conclusion

Our children are our future. Our responsibility as the elder members of our society is to care for our children, protect their health, and guide them to successful adulthood.

The protection of children against toxic chemicals in the environment poses a major challenge to modern society. Hundreds of new chemicals are developed every year and released into the environment, and many of these chemicals are untested for their toxic effects on children. Thus, the extent of children's exposures to environmental chemicals will almost certainly continue to increase: The problem is not going away. The challenge, therefore, is to design policies that will protect children against environmental toxins and will allow our children to grow, develop, and reach maturity without incurring neurologic impairment, immune dysfunction, reproductive damage, or increased risk of cancer as a consequence of toxic environmental exposures.

The hearing that you have convened today represents a spectacular opportunity to build policies that will meet this challenge. I commend you on having convened the hearing.

Statement of Rochelle Davis, Illinois Healthy Schools Campaign

Chairman Jeffords and members of the committee, I am Rochelle Davis, Executive Director of the Illinois Healthy Schools Campaign. I would like to thank you for the opportunity to submit a written statement regarding the work the Campaign is doing both in Illinois and nationally.

On behalf of the Illinois Healthy Schools Campaign, I would like to thank Senator Jeffords for convening this important hearing on school environmental health.

The Illinois Healthy Schools Campaign and its 85 endorsing organizations are dedicated to making Illinois schools environmentally healthy places to learn and work.

A review of Illinois laws and regulations by the Environmental Law Clinic found a number of glaring problems:

- There are no standards for school indoor air that have been established to protect children's health. (OSHA has exposure standards; they do not take into account children's vulnerability and apply only to employees.)
- Current inspection programs only cover traditional health, life and safety issues. They do not address indoor air quality (IAQ). Also, current inspection reports are not readily available to the public.
- Except for the Integrated Pest Management in Schools Act, there are no state initiatives promoting best practices for improving school indoor air.

While most of the responsibility to address this problem lies with state and local governments, we believe that the federal government can and must play a leadership role on this important issue. More specifically, the federal government should:

1. Fund and implement the Healthy and High Performance Schools provisions of the No Child Left Behind Act.
2. Pass the federal School Environmental Protection Act (SEPA, HR 111 and HR 3275/S 1716 in the 106th Congress) that will encourage schools to 'pest-proof' their buildings and thus reduce their reliance on the routine use of highly toxic chemicals.
3. Fund school repairs and construction, direct a federal grant program at high-needs schools, and offer tax credits to subsidize the interest on school construction bonds used for repairs, renovations, and new construction.
4. Fund the Clean School Bus Grant Program which will encourage the use of natural gas and clean diesel power buses.
5. Strengthen the role of federal agencies (US Environmental Protection Agency, Department of Education, Department of Energy, and National Clearinghouse for Educational Facilities) in promoting Healthy and High Performing Schools.

Since children spend most of their hours outside the home in school buildings, policy makers have a responsibility to ensure that children can attend school in a toxin-free and healthy environment. On behalf of the Illinois Healthy Schools Campaign, I want to thank you for addressing these important issues.

Sincerely,

Rochelle Davis

Rochelle Davis

Executive Director

To: The Senate Environment and Public Works Committee
Re: Hearing on Green Schools, 10/1/02
From: Tolle Graham, Coordinator Massachusetts Healthy Schools Network

The Massachusetts Healthy Schools Network is a statewide coalition of parent, education, labor, environment and public health activists working to address poor environmental conditions in schools. Through education, technical assistance and advocacy we have been working on the following initiatives over the last 5 years:

a.. Design, construction and maintenance for healthy schools
b.. Environmental and Indoor Air Quality information clearinghouse
c.. Promotion of "toxic-free" schools
d.. Establishment of school-based "Environmental Teams"

Here are some of the environmental health and safety problems we have identified in our state:

a. Over 800 schools in Massachusetts are located on or within ½ mile of a hazardous site

b. School conditions ranking Massachusetts 49th in the nation on the overall measurement of buildings with at least one inadequate building condition.

c. Asthma rates among school children reported higher in schools with indoor air quality problems by the Massachusetts Department of Public Health Bureau of Environmental Health Assessment Survey (1999)

d. Teachers report second highest work-related asthma cases in Massachusetts

e. Several hundred new schools currently being built that duplicate some of the same poor design features that pose potential environmental siting hazards, IAQ problems and maintenance costs that school districts can't afford.

Three years ago the Mass Healthy Schools Network organized the first conference "Designing, Renovating, and Maintaining our School Buildings" co-sponsored by, the Office of Civil Rights in the US Department of Education, the Massachusetts Public Health Association, the Massachusetts Coalition for Occupational Safety and Health, the Massachusetts Medical Society, the Teachers Association and the U.S. Environmental Protection Agency.

Twenty-two additional health, environment, school related organizations and agencies endorsed it. Conference participants, encouraged to attend as "teams" from their school districts, included school administrators, teachers, parents, health professionals, school committee members, school design committee members, as well facilities and maintenance staff.

In a follow-up conference survey, close to 50% of respondents said they would like to see regulations or laws that require Massachusetts Board of Education School Building Assistance Bureau to include specifications regarding environmental and indoor air quality standards. In addition, they recommended changing the bid process to require all bids to estimate the costs of maintaining the buildings and materials for life cycle cost comparison. Few schools reported even having a maintenance plan. These responses have been echoed over and over again in all of activities we've engaged in since that conference.

The Mass Healthy Schools Network has spearheaded some reforms within our state that have the potential for greatly improving school environments and student and staff health. They are:

a. Won passage of the Children's' and Family Protection Act requiring integrated pest management plans in schools and school grounds

b. Adoption of health and safety requirements (SMACNA Guidelines) for schools seeking funds for construction projects from the Massachusetts Department of Education.

c. 2nd State in the nation which is about to adopt a school environmental siting regulation (public comment period till November 2002).

d. Developed model regulatory language for healthy high performance schools which are being reviewed by the State Board of Education and the Healthy Schools Council representing state and federal agencies that have some authority over schools

Although we feel encouraged by these actions we feel strongly that Federal requirements and funding are both critical to promote national standards for school environmental health and safety. We therefore support the testimony of our National advocates from the Childproofing Our Communities Campaign and the New York Healthy Schools Network and specifically ask you to support:

a. Requiring the EPA to develop school environmental siting criteria and proper cleanup guidelines to reduce the risk of exposure for children and school staff

b. Fund and implement the Healthy and High performance Schools provision of the Leave No Child Behind Act

c. Funding to promote "green building" practices in school construction and renovation.

d. Reinstate health and safety grants for emergency school renovations (2000)

e. Expand the EPA's schools programs which provides "tools" for schools to their school indoor air and environmental hazards. If Committee members wish to get more detailed information about our efforts to improve health and school environmental conditions in Massachusetts, please feel free to contact: Tolle Graham, Healthy Schools Program Coordinator, MassCOSH, 617-825-7233 x19 or Tolle.Graham@masscosh.org

The Healthy Schools Network includes:

Asthma and Allergy Foundation of America, New England Chapter

Boston Urban Asthma Coalition

Bowdoin Street Health Center

MA Association for the Chemically-Injured

MA Coalition for Occupational Safety (MassCOSH)

MA Parent Teacher Association

MA Public Health Association

MA Teachers Association,

MA Public Interest Research Group (MassPIRG)

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Toxics Action Center

Western MassCOSH

VERMONT PUBLIC INTEREST RESEARCH GROUP
PIRG

Statement of Suzanne Miller

October 1, 2002

Good Morning Chairman and members of the Environment and Public Works Committee.

Please accept my testimony from the Vermont Public Interest Research Group (VPIRG) regarding healthy schools in Vermont for today's hearing on "Green Schools."

Currently, many Vermont schools have environmental health problems that pose health risks to children and staff. For many years now, VPIRG has worked to rid schools in Vermont of environmental hazards and reduce the possibility of children being exposed to harmful chemicals while at school. A few examples of environmental hazards include poor indoor air quality from old ventilation and heating systems, the build-up of unhealthy molds, routine application of pesticides within (and outside) many Vermont schools, and the use of harmful chemicals found in certain cleaning fluids and solvents, school laboratories, and art supplies.

In 1998 VPIRG conducted a survey of Vermont schools to determine the extent of chemicals found in the classroom. We learned that 75% of schools surveyed used pesticides on a monthly basis, while 88% of those surveyed used maintenance products containing chemicals linked to negative health effects. Headaches, respiratory problems, stomach aches, and behavioral and learning disabilities are all common symptoms of environmental health exposures.

While the survey was conducted, a student in Newport Vermont was rushed to the hospital after losing consciousness because of poor air quality found at North Country Union High School. The school was found to have elevated levels of benzene, styrene, and carbon monoxide, and air circulation within the school was poor. Multiple complaints followed from staff, and at least 76 students cited headaches and stomach problems. At first, the school administration was very reluctant to acknowledge that there was a problem with indoor air quality, but after the threat of a "sick building syndrome" lawsuit from staff, and heightened community activism, the school agreed to look into the issue. Shortly thereafter with the help of the community and some EPA funding, the school revamped its ventilation system and drastically improved the air quality in the buildings, creating a much safer environment.

The North Country Union High School is not an isolated case of air quality hazards in Vermont's schools. In fact, the state legislature recognized that there could be serious health consequences from environmental hazards and passed a law in 2000 known as the "School Environmental Health Act," or Act 125. The law requires the Vermont State Department of Health to create a voluntary program for all schools that will reduce harmful exposures to chemicals, and lead to improved environmental health conditions in schools.

Although the intent behind the law was clear in that it was to improve school environmental health, unfortunately the implementation of this law has been dismal. There are three reasons why this law has not yet improved environmental health at a single school since 2000. First there is inadequate funding and resources available for implementation of an effective statewide program. Second, there is strong reluctance from many school administrators in recognizing that indoor air quality and environmental

conditions at schools can relate to or cause serious health problems among students and staff. Third, the act does not require Vermont's schools to actually take steps toward making buildings and facilities safer. This act is not well designed to protect children.

Since the law's inception, VPIRG has worked hard with state officials to further the implementation of Act 125. Sadly, the lack of funding and of public awareness has significantly delayed the improvement of environmental health in Vermont's Schools. Vermont desperately needs federal assistance with funding and with resources to make its schools and buildings greener and safer for children.

VPIRG is currently conducting a new survey with the University of Vermont, and the Vermont Department of Education to determine the extent of pesticide use within and outside of Vermont's schools and buildings. Many states require advanced notification to parents when pesticides are applied at school, and the use of integrated pest management policies in schools. Integrated pest management policies, and pest-proofing of schools is a highly cost effective way for our schools to improve their infrastructure and to reduce the use of toxic chemicals. Vermont's schools lack these requirements, and so far many completed surveys are showing that schools are not engaging in integrated pest management, are potentially exposing children to pesticides at school, and are not warning parents of pending applications. Nor are they taking appropriate steps to pest-proof their buildings and facilities.

Although this survey only focuses on pesticide use at schools, we strongly believe that poor air quality, mold outbreaks, and other chemical toxic exposures are likely to be found throughout Vermont's schools. Not implementing Act 125 and not having federal funds or legislation to promote environmental health at schools puts all Vermont's children at risk. We ask for your assistance in making school buildings and grounds in Vermont, and around the U.S. safer.

Specifically, we are asking for:

- The funding and implementation of the Healthy and High Performance Schools provisions of the "Leave no Child Behind Act" – which will allow the U.S. Department of Education to research the links between environmental hazards at schools and children's health and learning and establish state-based programs for greener schools.
- Expansion of the U.S. EPA's schools programs to improve indoor air quality.
- Passage of the Federal School Environmental Protection Act (SEPA) which would make schools "pest-proof" and would reduce the necessity for routine reliance on pesticide use.

Thank you for your consideration of this matter, and for the opportunity to voice concern about school environmental health in Vermont. If I can be of any further assistance to your committee I would be happy to provide more information.

Susanne Miller
Environmental Health Advocate
VPIRG
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Statement
of
Derek G. Shendell

To whom it may concern:

I am a young scientist and public health professional in the field of children's environmental health working and training in California. My interests, however, have included urban areas in the United States and Latin America witnessing substantial population growth and migration to those cities, respectively. My dissertation for a multidisciplinary professional-track doctoral program at the UCLA School of Public Health concerns school indoor environmental quality (IEQ) of California public school classrooms, especially portable classrooms. The three projects included in the dissertation conducted quantitative measurements of toxic and odorous volatile organic compounds, thermal comfort parameters, and/or air exchange or effective ventilation rates. In addition, qualitative surveys and interview questionnaires were developed and conducted to assess potential indoor and outdoor pollution sources, moisture damage and mold growth, energy use, and custodian knowledge of HVAC operation and maintenance (O&M). Lessons learned have been shared with researchers in agencies and universities in California and Texas.

These projects, and others I work on at Lawrence Berkeley National Laboratory, Indoor Environment Department, address linking energy efficiency and IEQ parameters or the impact of local traffic from freeways on ambient and thus indoor air quality at schools. I constructed the annotated bibliography to be presented by Claire Barnett of the Healthy Schools Network, Inc. (Albany, NY). This document included papers and presentations from recent international conferences on school IEQ and health as well as three final LBNL reports on our relocatable classrooms study; copies can be available upon request.

Nevertheless, overall and especially in the United States, data on school IEQ and environmental health, including "best practices" for designs and O&M, are limited. Therefore, research and demonstrations projects in different geographical areas/climate zones should be conducted on:

1.) Energy efficiency and IEQ linkages through adequate and/or improved ventilation and environmentally-friendly building designs, e.g., interior finish materials and furnishings;

2.) IEQ in relation to health, attendance, and productivity of teachers and students.

Without a doubt, public school populations will continue to increase across the United States, intensifying the need for clean, comfortable, and environmentally-friendly school facilities, new or modernized, and proper O&M practices. The importance of energy efficient classrooms with low-emitting construction, interior finish, furnishing, teaching and cleaning materials is evident. Congress should fund the Healthy and High Performance Schools program.

Sincerely,
Derek G. Shendell, MPH
D.Env. candidate, UCLA School of Public Health, Los Angeles, CA
Senior Research Associate, LBNL (IED/EETD), Berkeley, CA

NOTE: Thoughts contained in this email belong solely to the author and should not be interpreted as those of the university or of the national laboratory he is affiliated with.

TESTIMONY FROM GROUND ZERO

Jenna Orkin
Steering Committee, 9/11 Environmental Action

I am the mother of a 17-year-old who was a student at Stuyvesant High School four blocks north of Ground Zero when the World Trade Center was attacked. I took my son out of the school in February because of the alarming degree of environmental contamination there.

Stuyvesant reopened on October 9 with much fanfare and cries of, "Get back to normal!" and, "Show the terrorists!" Unbeknownst to us at the time, that was the week that Dr. Thomas Cahill of U.C. Davis conducted studies a mile north of Ground Zero that revealed levels of very- and ultra-fine particulates that were higher than at the Kuwaiti oil fields. For the next eight months, Stuyvesant got a double whammy of toxic waste: Not only did they have the World Trade Center site with its fires and fumes to the south. But also, 60 feet from the north wall of the school was the waste transfer barge that was loaded with toxic debris to be carted away to Staten Island.

Wind off the Hudson River blew fine particles and dust into windows, (yes - some teachers kept windows open) cracks and crevices and into the ventilating system as diesel powered trucks idled and diesel powered cranes operated twenty-four/seven. According to the Sierra Club and the American Lung Association of Pennsylvania diesel, too, contains dozens of toxins and carcinogens.

Particulate Matter 2.5 - dust that is small enough to penetrate deep into the lungs and not come out again - was often higher at Stuyvesant than at Ground Zero. Isocyanates and tetrachloroethane were high when they were measured but after the troubling results, they weren't measured again. Lead in the ventilation system, of which wipe samples were taken only when parents threatened to sue the Board of Education, was thirty times the level one would expect to find on the floor. (There is no official standard for lead in ventilation systems.) Asbestos was found at 250 times normal levels in the auditorium which had been used as a triage center.

Despite all these findings, the Board of Education (now the "Department of Education") continues to maintain the building is and always has been safe. The lead, they said after the results of the wipe samples were announced, would stay in the walls. The asbestos, they said after the results of the auditorium samples were announced, would stay in the carpet. These efforts to placate parents were uttered with great conviction by officials who at the same time admitted they had no expertise on the subject.

How was Stuyvesant protected against the onslaught of toxins? Until the end of January the filters in the ventilation system were 10% effective. At that point they were upgraded to 40% effectiveness. And although we had been told before returning to the building that the school had undergone a thorough cleanup including the ventilation system, we later learned that in fact the ventilation system had not been cleaned.

Even after FEMA allocated 20 million dollars to clean the Ground Zero schools, the Board of Education refused to clean Stuyvesant's ventilation system until parents, using the pro bono services of attorney Richard Ben-Veniste of Watergate fame, threatened to sue. Now that the asbestos has been found in the auditorium carpet (using a test performed not by the Board of Education but under the auspices of Howard Bader, an engineer hired by the parents) the Department of Education is balking at appropriately testing or abating the auditorium's plush seats. Presumably they believe that the asbestos fibers took a unanimous vote to boycott the seats in favor of the carpet.

While the Board of Education and other government agencies, taking their cues from the EPA, maintained that the air at the school and in downtown generally was safe, people were getting sick. In a NIOSH study done at Stuyvesant in the spring, 60% of the staff reported that they had had respiratory and other symptoms which they attributed to their exposure to the air at school. No such study has been conducted among students. NIOSH has no authority to study students who outnumber staff by 10 to one and who breathe more air per pound of body weight than adults. There is no system to protect children.

However, parents report that their children have been diagnosed with new-onset asthma which may last the rest of their lives; chronic sinusitis entailing heavy doses of steroids and antibiotics and the newly-coined 'chemical bronchitis." One child had her first asthmatic attack in seven years - an episode that landed her in the Emergency room - after swimming in the pool at Stuyvesant which had not been cleaned.

Already Ground Zero workers are suing the city for their exposure to toxins during the recovery operation. And we have just learned that Bear, a dog who was responsible for a record number of rescues, has died. Autopsy revealed numerous cancers. The majority of the other rescue dogs are also sick. The exposure of the students and staff at Stuyvesant was not so different from that of these rescue workers of various species.

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After four months of working to improve conditions at the school and in Lower Manhattan generally, I put my son in an alternative high school, the only school that would take a junior midyear. It had no classes except for one in Planned Parenthood. Instead, it offered internships where my son stuffed a record number of envelopes. This year, more than three weeks into the first semester, I have moved him to yet another school.

Stuyvesant is a microcosm of everything that can go wrong in a disaster. The foxes are in charge of the chicken coop. Having made initial mistakes they are in the position of having to defend those mistakes by compounding them. No one but the PA and a few environmental groups were brave enough to stand up for our children, and to help us ask the right questions and get us copies of regulations.

In the last year, a number of parents have become activists, researching beyond the contamination of their own schools and neighborhoods to try to find trends throughout the country. In my attempts to research such environmental issues I went to Google and typed in the phrases "elementary schools" and "toxic." Over 23,000 cites came up. It's enough to make one think that those in charge have interests in mind other than the well-being of children.

Statement of Joellen Lawson, Fairfield, CT

My name is Joellen Lawson and I was a Special Education teacher at McKinley School from 1991-1998. This is the elementary school in Fairfield, CT that was permanently shut down in October 2000 due to severe mold contamination. Although it is painful to talk about I am here today because I feel a strong moral obligation to share how long-term and acute mold exposure ended my twenty-three year teaching career and has seriously damaged my health and financial security. Mine is a cautionary tale that warns us of what can happen in the absence of enforceable air quality standards. My case demonstrates that there are not enough safeguards to guarantee teachers and students a safe and healthy environment to work in. Thankfully those of you in the legislature are acknowledging and addressing these important issues as you seek solutions to remedy the problem of poor air quality in the schools. I only wish the current level of public awareness and the legislative initiatives being proposed had been established a decade ago.

In 1991 I joined the faculty at McKinley as a part time Special Ed. Teacher, I had just completed my second master's degree (ironically in Health Education) and was taking additional courses in order to become certified in Elementary Education. My volunteer work in the community included presenting workshops for statewide conferences for CACLD (CT Association for Children with Learning Disabilities) and serving on the board of directors for the ADD Society of Feld County (a support group for parents of children with attention deficit disorder). My expertise in teaching children with ADD was the focus of my work as a seminar leader for the American Institute for Creative Education as well as an educational consultant and tutor for the ADD Institute of Westport. So in summary, I was very invested in a career I would have described as dynamic, multifaceted and very fulfilling.

My first recollection of not feeling well occurred during the 1992-1993 school year. That particular year I was teaching in room 118 which doesn't have any windows. By noon each day I was suffering from headaches, burning eyes, mental fatigue and the beginnings of a chronic cough. I vividly recall a conversation I had with my principal regarding my health problems that appeared to be caused by "something" in that room. Fortunately, by the end of the school year the principal did honor my request for a transfer to a classroom with a window.

From 1993-1997, my classroom was a very small office in the library with a window. At first, my symptoms did improve. In 1994 my position was increased to full-time and as I began to spend more time in the building my cough worsened and new symptoms emerged. Now in addition to burning eyes, my tongue was usually swollen; I had visible hair loss on my head and my eyelashes started falling out. By 1995-1996, the coughing spells worsened and during one of them I herniated a disk. More neuromuscular difficulties included muscle spasms, tingling sensations and occasional tremors. I did consult several doctors, but blood tests and lung X-rays failed to pinpoint a cause. Finally, in September 1997 I was delighted to be assigned to a standard sized classroom with ample closets and windows. The previous occupant had packed the closets with books, kits and teaching materials. It wasn't until May of 1998 I had the time to clean them out. Over the course of four days, I removed twenty bags of mold-contaminated materials. As I do have a history of allergies and asthma I did expect some exacerbation of my symptoms. However, I never anticipated the long-term consequences that would result. By the second day of cleaning I asked the custodian for help because I was getting dizzy and quite sick to my stomach. The following Monday I awoke at 1 am and the room was spinning. For the next ten hours I suffered from intense vertigo, diarrhea, vomiting and tremors. When I was admitted to Danbury Hospital's emergency room, the attending physician told me that a virus or food poisoning were the likely culprits for those ailments after I proposed my theory that the moldy materials could have triggered the incident.

Two days after my trip to the emergency room I felt compelled to return to work to finish my

end of the year obligations. Completing job tasks was hampered by dizziness, intermittent nausea and the sensation that my brain was swollen. Little did I suspect that after June 1, 1998 my life would never be the same. At no time before this had I felt so seriously ill. Yet, I still expected to fully recover over time. So regaining my health was the goal for the summer of 1998.

By late June my symptoms not only persisted, they were worse. The dizziness had not abated and was further complicated by a very severe ear infection. No hearing loss was ever detected by the ENT, but since then I have difficulty tolerating a normal sound volume. Going to a mall or eating out at a restaurant can be physically debilitating because of my inability to cope with the noise level characteristic of such places. Other sensory disturbances included increased sensitivity to light, an inability to control eye tracking and intermittent blurring. Balance problems made walking a task that was demanding and required considerable effort. There were days when the floor appeared tipped to one side. My kinesthetic experience could be best expressed as feeling as though I was still in motion while I was at rest. By August, the consensus of two primary care physicians, an ENT and a neurologist was that I was afflicted with a "vestibular dysfunction". The vestibular system consists of the brain, spinal cord, eyes, skin, muscles, joints of the body and inner ear. It is responsible for maintaining one's sense of equilibrium or balance. However, a vestibular dysfunction could not account for other symptoms such as night sweats, low-grade fevers, swollen glands, an excessive need to urinate, a sharp pain behind my eyes and terrible migraine headaches. Two peculiar symptoms: a black growth on my tongue and mild bleeding from my ears were also reported to my doctors.

The primary care physician who would eventually fill out my disability paperwork and coordinate input from the many specialists who evaluated my symptoms kept extremely detailed records. In August 1998 she did record my comments about teaching in a moldy classroom and that my most debilitating symptoms manifested within days of removing moldy materials from the classroom. Not one of the well meaning medical professionals involved in my case recognized the significance of this information until nearly three years later.

Assured by my doctors that a vestibular dysfunction would repair itself within a two-three month period, I attempted to return to work in October 1998. Had I truly understood my illness I would have realized the personal purchase of a HEPA filter and half-day schedule would not protect me from another assault to my immune system. Within weeks I suffered another major episode of vertigo and simultaneous vomiting and diarrhea followed by heart palpitations and shortness of breath. For the first time I was painfully aware that my cognitive functioning, especially short term memory problems were interfering with my ability to communicate with others and teach effectively. Word retrieval and multitasking were excruciatingly difficult. Finally, I accepted that I could not will myself into weilness and a formal medical leave of absence was necessary. I was granted a medical leave of absence for the 1999-2000 and 2000-2001 school years. During my medical leave my primary care physician ordered extensive medical testing to rule out everything from multiple sclerosis to a brain or vestibular tumor to Lyme's disease.

The closing of McKinley School in October 2000 was a turning point. Soon after I contacted Dr. Eileen Storey (UCONN Occupational Medicine), John Dorland (FEA president) and Mary Fitzgerald (Pupil Personnel for Ffld Public Schools) to share my story. The complex health, career, financial and legal implications raised by the shutdown of McKinley were totally overwhelming. I began by addressing those questions most pertinent to my health and career issues. I wondered: Had my illness been preventable? Had my thoughts about the mold in my classroom which had been dismissed and ignored been on target from the beginning? If this were true, would there be changes in my prognosis and treatment? Could there be magic bullet that would enable me to return to work in September 2001 when my medical leave would have expired?

Initially, I did not speak out publicly about these matters because without further proof I believed it would be irresponsible to alarm those McKinley teachers, parents and students who were already traumatized by what had taken place. By the spring of 20011 was personally convinced by mounting evidence that my illness directly resulted from breathing in toxic mold spores while teaching at McKinley. I utilized numerous resources before coming to this conclusion although my appointments with Dr. John Santilli were pivotal. Dr. Santilli had already treated fifty McKinley staffers and students who became ill from mold exposure. In collaboration with a mold toxicologist, he had analyzed the results of air samples taken from McKinley. After extensively reviewing my medical records, Dr. Santilli confirmed that the respiratory, digestive, neurological and sensory disturbances I had been suffering from were consistent with exposure to the high levels of mold (stachybotrys, aspergilllus and penicillum) found in classrooms I had been teaching in during my seven years at McKinley.

The good news was that I finally had some definitive answers. The bad news was there would be no magic bullet to cure me and Dr. Santilli could not recommend I return to work in the fall. Despite all the evidence to the contrary, I had been clinging to the hope of holding onto my tenure in Fairfield. My disappointment was further compounded when my request to extend my medical leave was denied by officials in Fairfield. It was devastating to file for a disability retirement at the age of forty- six some twenty years early.

As I sorted out my health and career issues, I was also wrestling with legal and financial ones. In November 2000 my husband and I met with a workman's compensation attorney who warned us that proving an environmentally triggered illness would be very challenging especially because at that time I lacked a medical advocate to back me up. She also cited probable complications with statute of limitation laws as 2 Y2 years had transpired since the onset of my disabling condition. Later other attorneys declined to take my case because of the statute of limitations.

This legal predicament leaves me dealing with serious financial consequences. Despite the disability payments I receive, my income has been substantially reduced and concern for my long-term financial security is a considerable source of anxiety. Living on a fixed, reduced income places stringent restrictions on my lifestyle and denies me access to resources that could contribute to my recovery. For example, Dr. Santilli suggested I hire someone to help clean my house in order to avoid contact with allergens that testing has shown to compromise my immune system. However, I simply can no longer afford such luxuries.

Now if we fast forward to my current situation, it is clear that my debilitating condition has robbed me of my professional identity and significantly altered my personal and social life. Essentially I am housebound with the exception of physical therapy or doctor's appointments which my parents and husband usually drive me to. A tremendous loss of independence comes from not being able to drive a car. Since June 1, 1998 I rarely drive due to safety concerns for myself and others. In order to get behind the wheel of a vehicle one should be able to turn their neck and head from left to right and move their eyes from the rearview mirror to the view of oncoming traffic with ease. I am sure most people take for granted their ability to perform such tasks. In my case I have days when the act of moving my eyes to look up or down can elicit visual blurring, nausea and a loss of balance. This can happen without the introduction of additional demands on my vestibular system such as movement. When this occurs I cope best by remaining as still as possible and aiming my gaze directly in front until the episode is over (which may last minutes, hours or days). At times the vertigo, vomiting, tremors and full body sweats have been so incapacitating that I have been unable to walk from the bedroom to an adjoining bathroom and have had to use a bedpan. During these episodes my husband utilized many vacation days from work because I was unable to care for myself. As you might imagine it is hard to schedule plans due to the highly unpredictable nature of my symptoms as they wax and wane on a day-to-day basis.

Another especially disconcerting component to this cluster of symptoms has been my inability to lay flat, with my head down since June 1, 1998 without considerable discomfort. The discomfort may manifest as severe eye, neck, or headache pain as well as lightheadedness, dizziness, tremors or full-blown vertigo. To compensate I usually sleep on my left side elevated by two pillows. As a result of my inability to lay in a supine position, the quality of my sleep is compromised and I developed adhesive capsilitis in January 2001. Adhesive capsilitis "frozen shoulder" is a painful condition that limits the use of my left arm and shoulder making such tasks such as washing or fixing my hair, tucking in my shirt or almost any task requiring the use of two hands at best, challenging.

My overall stamina is further depleted by increased sensitivity to environmental allergies, shortness of breath and a chronic cough. These respiratory ailments put an end to my favorite hobby, singing, which had been a wonderful source of joy and self-expression during eight years of vocal training. I still miss my weekly voice lessons and performing in two to three recitals each year.

On good days, I am able to do simple chores such as doing dishes, laundry and cooking as long as I take rest breaks every few hours. This is a far cry from the active, physically fit person I once was. In 1991, I practiced yoga regularly and could do a forty-five minute aerobic routine, three to four times a week. Now if I am lucky I can exercise at a moderate pace for ten to fifteen minutes. One area where I have observed improvement has been in the gradual return of my cognitive abilities particularly short-term memory skills.

Last Fall when I agreed to be interviewed for NEA Today and Schoolhouse News my motivation was to warn others of the dangers of poor indoor air quality before it is too late. I have learned my case is not an isolated one as teachers throughout the U.S. have told me about mold contamination in their schools and the physical symptoms they have endured which are sadly reminiscent of mine. Their stories have strengthened my resolve to campaign for legally enforceable air quality standards. I believe if such policies had been in place the McKinley School disaster might have been averted. The extensive and extremely hazardous mold contamination at McKinley would not have been allowed to fester for years. The "deferred maintenance" that contributed to the building's deterioration would not have been so readily tolerated had regular air quality testing been implemented.

Those of us with pre-existing conditions such as allergies and asthma who are most vulnerable to the effects of toxic air quality would have been more cognizant of the risks we were undertaking by simply coming to work at a sick building. I only wish I had been armed with the knowledge I have acquired since McKinley was shut down, before I was assigned there in 1991 and especially after my trip to the emergency room in 1998.

Many of the health and career decisions I made in 1998 would have been dramatically different had I comprehended the connection between my illness and work environment. First of all, I would never have exposed myself to such air quality again by re-entering the building. Secondly, I would have immediately filed for a workman's compensation claim. Finally, I would have sought the advice of a physician with a background in mold related illnesses. In that way, I might have avoided the waste of time, energy and expense of meeting with fourteen medical practitioners who ordered testing and the use of medicines which for the most part actually aggravated my condition.

Believe me, I do not relish exposing parts of my medical history in a public forum such as this. I realize doing so will not repair my health, fix my financial woes or bring back the daily contact with my students that made my job such a deeply satisfying one. However, if in some way my testimony helps to protect the basic civil right of teachers and students to work in a safe and healthy environment, then this will have been worth it. Thank you for you kind attention.

Sincerely,

Joellen Lawson

TESTIMONY FROM PUBLIC SCHOOL 65 QUEENS
OZONE PARK, NEW YORK
Katie Acton
Parent Advocate

To introduce myself, I am Katie Acton, residing at 103-23 105th Street, Ozone Park, Queens, NY 11417. I am married with two daughters, ages 9 and 3. Kaylyn Acton-Chadee, my nine-year old attended PS 65Q located at 103-22 99th Street, Ozone Park, NY 11417. The principal is Mrs. Iris Nelson and can be reached at (718) 323-1685. The school falls under the NYC Department of Education, District 27, superintended by Mr. Matthew Bromme. Kaylyn was in fourth grade last school year.

In May of 2002, the Queens Forum published an article regarding the possible toxic condition involving a subsurface plume of TriChloroEthylene that is located beneath the school and the immediate environs. Several concerned parents did come together to get answers to the unanswered. Since that time, the NYCDOE has retained external testers to test the quality of air inside the school. The results are doubtful. In July if 2002, further tests were conducted outside the school involving the groundwater and the soil. The results were very alarming in that they were way above the "acceptable" limits.

Other events have happened during this period. PS 65Q was suddenly labeled a "Title I" school and parents were offered to have their children transferred to better performing schools within the district. Those applications were distributed in June 2002. The response was negative for transfers at that time. Transfers were suddenly approved in September 2002, right before school reopened.

The NYCDOE met with parents three times since May 2002, with the last meeting being on 08/29/2002. At the last meeting I attended, Congressman Anthony Weiner was kind enough to appear on our behalf. He raised important issues on the growth of the plume and it was confirmed that the plume is growing and will grow upward. The delegates also indicated that some measures were being taken to clean up the environment. One involved the installation of an air evaporating mechanism to release the pressure build up below the school.

Another critical issue was the financing of the clean up. It was disclosed that negotiations were in progress with the Mother Company of the dumpers of the TCE. Why must innocent children and the school public and the community wait on the selfish concerns of others to clean up such a potential hazardous condition. Classes are also held in classrooms located in the basement, whose walls separate the inside from the positive TCE soil on the outside.

Even though Kaylyn is no longer a student there, she was affected. She developed asthma. Since the TCE was unveiled, parents have come together and disclosed that their children have also been suffering from sudden onset asthma and persistent headaches. There have also been some cases of cancer and that a teacher has since passed away from

cancer. Her demise was held a secret for 2 weeks until the school population was informed.

I think that the problem is not just restricted to the school alone, but the entire surrounding neighborhood of which the "transferred" parents still reside. It is with deep sadness that I have to document that the Members of the Board of the Parents Association at PS65 have not been supportive in

this matter. Instead of acting as a liaison between the parents and the school authorities, they choose to do otherwise – nothing. My persistence in the matter is one to have the relevant authorities start the clean up immediately, and the confirmation that our community's children are in a fairly safe environment. We, the residents/parents believe that City and State Agencies need to get involved and do what is ethically and morally correct.

The agencies represented were:

1. NYSDEC – New York State Department of Environmental Conversation
2. NYSDOH – New York State Department of Health

   Peter Constantekes

   Donn E. Hettrick, Sanitary Engineer? 800-458-1158 X 27880
3. NYCHMG – New York City Department of Health and Mental Hygiene
4. NYCDOH – New York City Department of Health,

   Chris D'Andrea, Industrial Hygienist 212-788-4290

   Gary Krigsman MD, DOH Physician for District 27
5. NYCDOE - New York City Department of Education,

   David Klasfield, Deputy Chancellor of Operations

   Bernard Orlan. Director, Environmental Health and Safety

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Another representative was Mr. Davis Harrington, Field Engineer. The agency he represented was not clear. He can be reached at 518-402-9564. He was involved on the drilling of the wells for sampling surrounding the school. ATC Associates, Inc was retained by the NYCDOE to perform the air testing inside the school. Their representatives were present at all three meetings, but did not address the meeting.

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